

Replacement

Fuses and Specifications	5
Electronic Slide Assembly (Backpack)	5
Generator Top Plate	5
Power Distribution PCB	5
Table Power Supply	6
Table Movement CPU PCB	7
Access Covers	8
Tower	8
Tower Top	8
Tower Side	9
Rear Electronics Slide (Backpack)	9
X-Ray Support Arm	10
Top Arm	11
Bottom Arm	11
Vacuum Fluorescent Display	12
X-Ray Head	12
Flat Panel Display Arm	13
Flat Panel Display Monitor	13
Table Covers	14
Splash and Crash	14
Image Intensifier Power Supply	15
Arm Lateral, and Cassette Carriage Drive Motors, and Arm Leadscrew	15
Generator Cover Configuration	16
Cover Removal	18
X-Ray Arm Bearing Replacement	20
Lower Outside Bearing Replacement	23
Upper Outside Bearing Replacement	24
Inner Bearing Replacement	26
Tower and Table Electronic Assemblies	31
Table Motion CPU PCB	31
Version Update	31

Replacement

Removal and Replacement of the PCB.....	31
Relay PCB.....	33
Video Standards Converter.....	33
Frequency Inverters	35
Electronics Slide Enclosure (Backpack).....	38
Table Potentiometers and Limit Switches.....	39
Table Longitudinal Movement Potentiometer.....	39
Lateral Pot Replacement.....	40
Elevation/Tilt Potentiometer R1/R3 Replacement.....	44
Table Potentiometer Belts.....	46
Table Microswitches.....	46
Table Longitudinal Safety Switch	46
Table Up Movement Switch Strike Plate	47
Table Down Movement Switch Strike Plate.....	47
Tilt Movement -20° Safety Switch.....	47
Tilt Movement +88° Safety Switch.....	48
Spindle Nut Safety Limit Switch.....	48
Accessory Sensor Switches	49
Table Motor Replacement	51
X-Ray Arm Motor M2 Replacement	51
Elevation /Tilt Motors M1 and M3 Replacement.....	57
Table Longitudinal Motor M4 Replacement.....	60
Lateral Motor M6 Replacement	65
Cassette Carriage Motor M5 Replacement	67
Table Belt Adjustment and Replacements	75
Table Longitudinal Belt Replacement.....	75
Table Longitudinal Worm Gear Replacement	78
Table Longitudinal Belt Tension	85
Table Vertical-Tilt Belt Tension	85
Cassette Carriage Assembly	86
Drive Belt Tension.....	86
Tray Movement Potentiometer	87
Carriage System Potentiometer	88
Cassette Carriage and Image Alignment Switch.....	89
Movement Safety Switch.....	90

Replacement

Sense Switch Replacement	91
Bearing Replacement.....	101
Image Chain Component Replacement	105
II Carriage Replacement	105
New Carriage Configuration	110
Adjustment Instruction for Additional Bearings.....	110
Film Cassette Grid Replacement	117
AEC Chamber Replacement.....	118
CCD Camera Replacement.....	119
Generator Components Replacement	120
PCB Replacement.....	120
Power Input Assembly Access	122
Power Module Removal	122
AEC PCB, kV Control PCB, or Generic I/F PCB Replacement.....	125
Disassembly	127
Power Unit Cover Removal	127
AEC V2 PCB, its support, Generic I/F PCB, or kV Control PCB Removal	128
Verify	129
Calibrate	129
AC/DC PCB (3-Phase AC Power)	130
Disassembly	130
AC/DC PCB Removal.....	130
Rectifier Block Removal	131
Reassembly.....	132
Verify	132
EMC PCB (3-Phase AC Power)	133
Disassembly	133
AC/DC Module Removal	133
EMC PCB Removal from the AC/DC Module	134
Reassembly.....	135
Verify	135
LVPS-400 Power Supply.....	136
Disassembly	137
Filament PCB Cover Removal.....	137
Filament PCB Removal	137

Replacement

LVPS-400 PCB Removal	137
Reassembly.....	138
Verify	139
Rotation PCB.....	140
Disassembly	140
Rotation PCB Cover Removal	140
Rotation PCB Removal	141
Verify	142
Rotation Module Capacitor Set Replacement	143
Rotation Capacitor Removal	144
Verify	145
HV Tank Replacement	146
Tools Required	146
Disassembly	146

Fuses and Specifications

Electronic Slide Assembly (Backpack)

Ref. No	Part Number	Description
F1, F2	55-500358-00	FU, T, 0.1A, 250V 5x20MM, SLO BLO

Generator Top Plate

Ref. No	Part Number	Description
F1, F2, F3	55-500391-00	FU, HS, SQ BDY, 160A, 660V, FST ACTG
F4	67-132350-00	FU, GL, 1/2A, 250V, 1/4x1-1/4
F5, F6	67-132430-00	FU, GL, 3A, 250V, 1/4x1-1/4, SLO-BLO

Power Distribution PCB

Ref. No	Part Number	Description
F1	55-500344-00	FU, T, 2A, 250V, 5 x 20mm, SLO BLO
F2	55-500344-00	FU, T, 2A, 250V, 5 x 20mm, SLO BLO
F3 (Spare)	55-500343-00	FU, T, 1A, 250V, 5 x 20mm, SLO BLO
F4	55-500344-00	FU, T, 2A, 250V, 5 x 20mm, SLO BLO
F5	55-500347-00	FU, T, 5A, 250V, 5 x 20mm, SLO BLO
F6	55-500343-00	FU, T, 1A, 250V, 5 x 20mm, SLO BLO
F7	55-500349-00	FU, T, 0.5A, 250V, 5 x 20mm, SLO BLO
F8	55-500350-00	FU, T, 0.8A, 250V, 5 x 20mm, SLO BLO
F9	55-500344-00	FU, T, 2A, 250V, 5 x 20mm, SLO BLO

Replacement

Ref. No	Part Number	Description
F10	55-500343-00	FU, T, 1A, 250V, 5 x 20mm, SLO BLO
F11	55-500343-00	FU, T, 1A, 250V, 5 x 20mm, SLO BLO
F12	55-500344-00	FU, T, 2A, 250V, 5 x 20mm, SLO BLO
F13	55-500351-00	FU, T, 6.3A, 250V, 5 x 20mm, SLO BLO
F14	55-500347-00	FU, T, 5A, 250V, 5 x 20mm, SLO BLO
F15	55-500344-00	FU, T, 2A, 250V, 5 x 20mm, SLO BLO
F16	55-500343-00	FU, T, 1A, 250V, 5 x 20mm, SLO BLO
F17	55-500344-00	FU, T, 2A, 250V, 5 x 20mm, SLO BLO
F18	55-500350-00	FU, T, 0.8A, 250V, 5 x 20mm, SLO BLO

Table Power Supply

Ref. No	Part Number	Description
F1		Circuit Breaker, 16A, 250 V, 1.5-inches, SLO-BLO
F2	55-500346-00	Fuse, 4.0A, 250V, .25 x 1.25-inches, SLO-BLO
F3	67-135432-00	Fuse, 4.0A, 250V, .25 x 1.25-inches, SLO-BLO
F4	67-135431-00	Fuse, +24V, 3.2A, 250V, .25 x 1.25-inches, SLO-BLO
F5	67-135431-00	Fuse, +24V, 3.2A, 250 V, .25 x 1.25-inches, SLO-BLO
F6	67-135433-00	Fuse, 6.25A, 250 V, .25 x 1.25-inches, SLO-BLO
F7	67-137450-00	Fuse, 5A, 250 V, .25 x 1.25-inches, SLO-BLO
F8	67-130519-00	Fuse, 8 A, 250 V, .25 x 1.25-inches, SLO-BLO

Table Movement CPU PCB

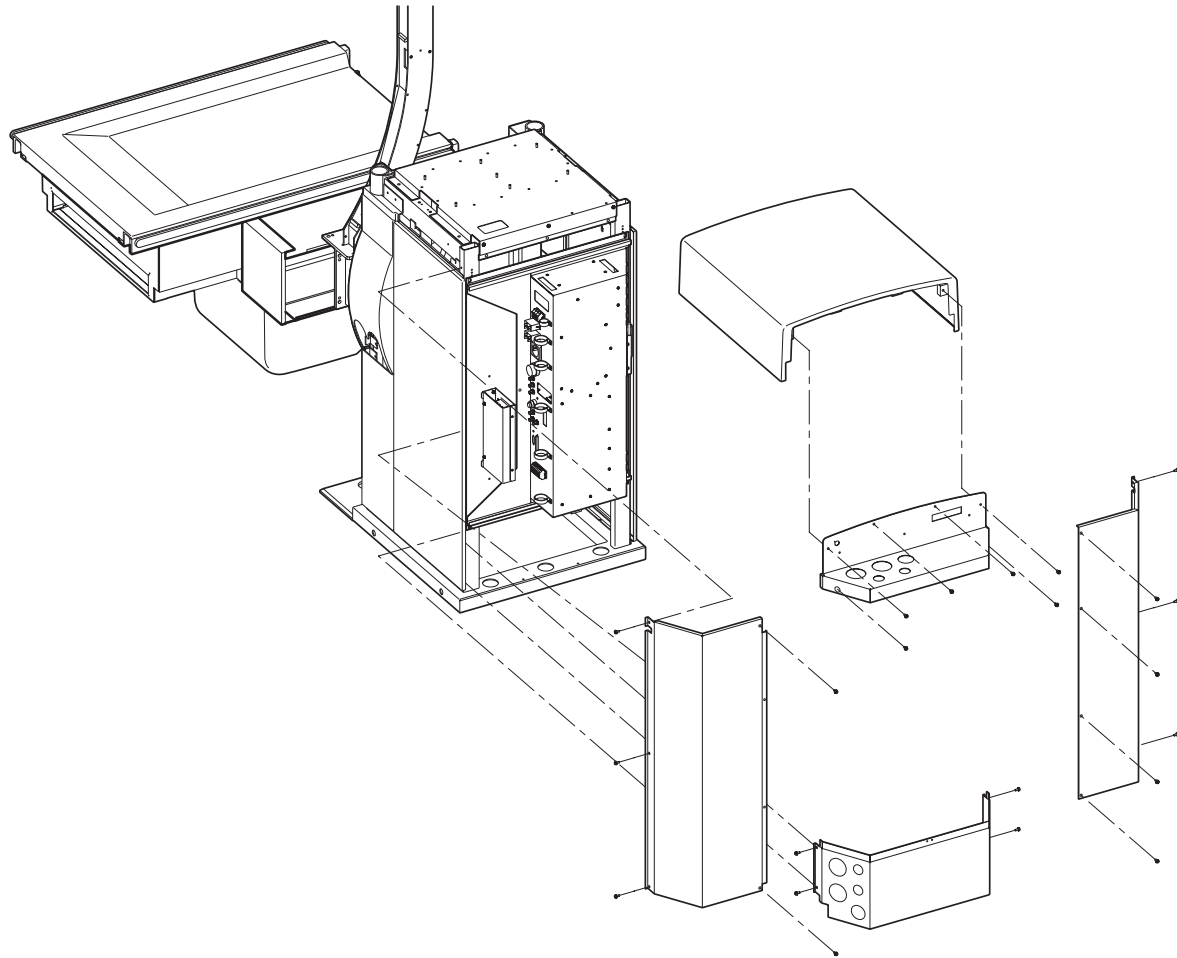
Ref. No	Part Number	Description
F1	55-500345-00	Fuse, CPU Power Supply, 3.15 A, 250V, 5 x 20mm, SLO BLO
F2	55-500349-00	Fuse, Analog Power Supply, 0.5A, 250V, 5 x 20mm, SLO BLO
F3	55-500340-00	Fuse, Cntrl Cons. Power Sup., 315 ma, 250V, 5 x 20mm, SLO BLO
F4	55-500358-00	Fuse, Footswitch Power Supply, 100 ma, 250V, 5 x 20mm, SLO BLO
F5	55-500340-00	Fuse, Display Power Supply, 315 mA, 250V, 5 x 20mm, SLO BLO
F6	55-500343-00	Fuse, +24 V, 1A, 250V, 5 x 20mm, SLO BLO
F7	55-500343-00	Fuse, +24V, 1A, 250V, 5 x 20mm, SLO BLO
F8	55-500358-00	Fuse, 100mA, 250V, 5 x 20mm, SLO BLO

Access Covers

Tower

Tower Top

1. The tower top cover is secured by four Torx-head screws through the rear panel and near the rim of the cover.
2. There are three Torx-head screws near the middle of the rear panel. Do not remove these screws unless the rear panel is to be removed.
3. Remove the screws and lift the cover off of the tower.



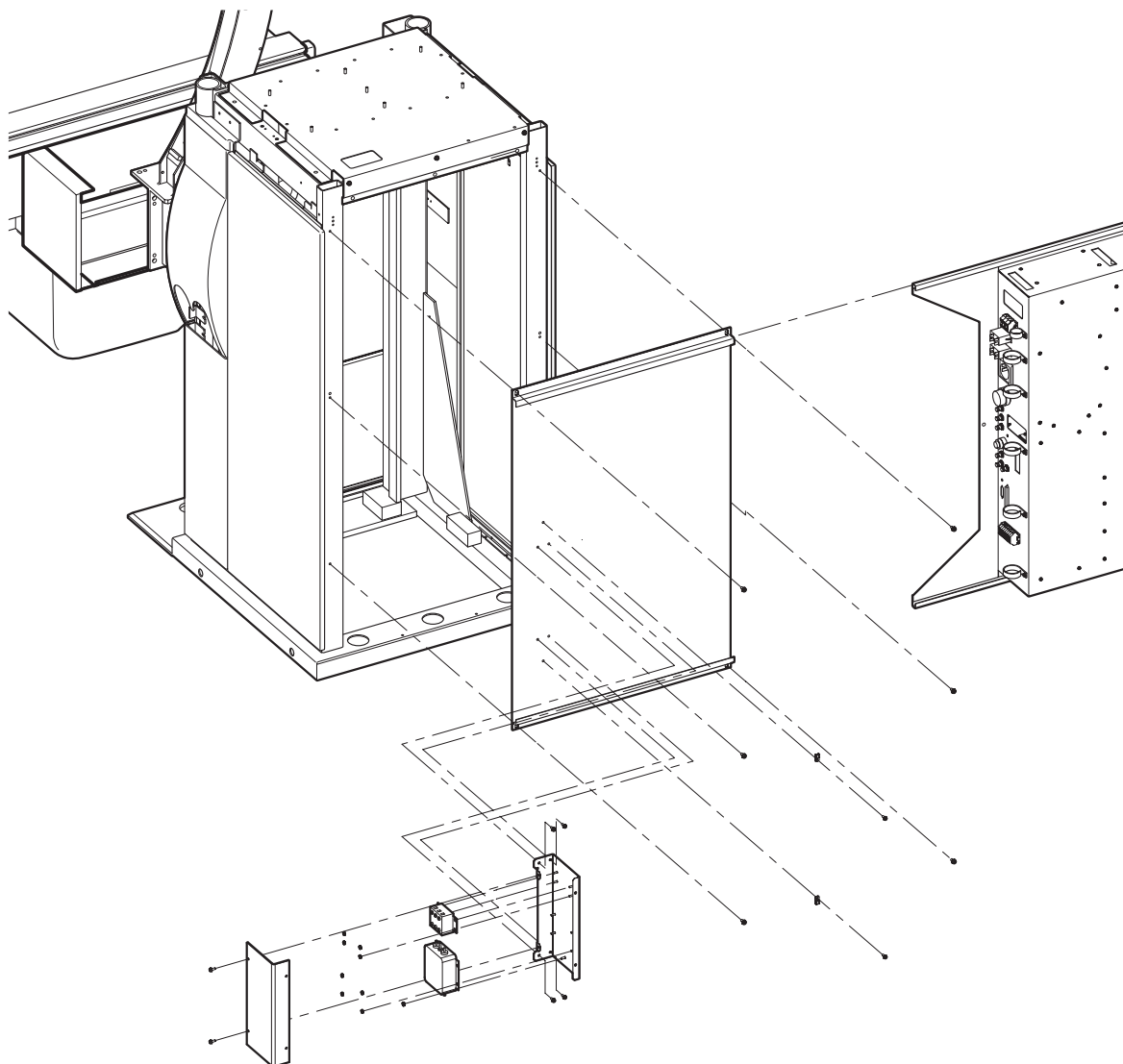
Replacement

Tower Side

1. The tower side cover opposite the Generator is attached to the tower frame by two screws at the bottom of the panel.
2. Remove the screws and pull the bottom cover outward to free the top bracket from the tower frame.

Rear Electronics Slide (Backpack)

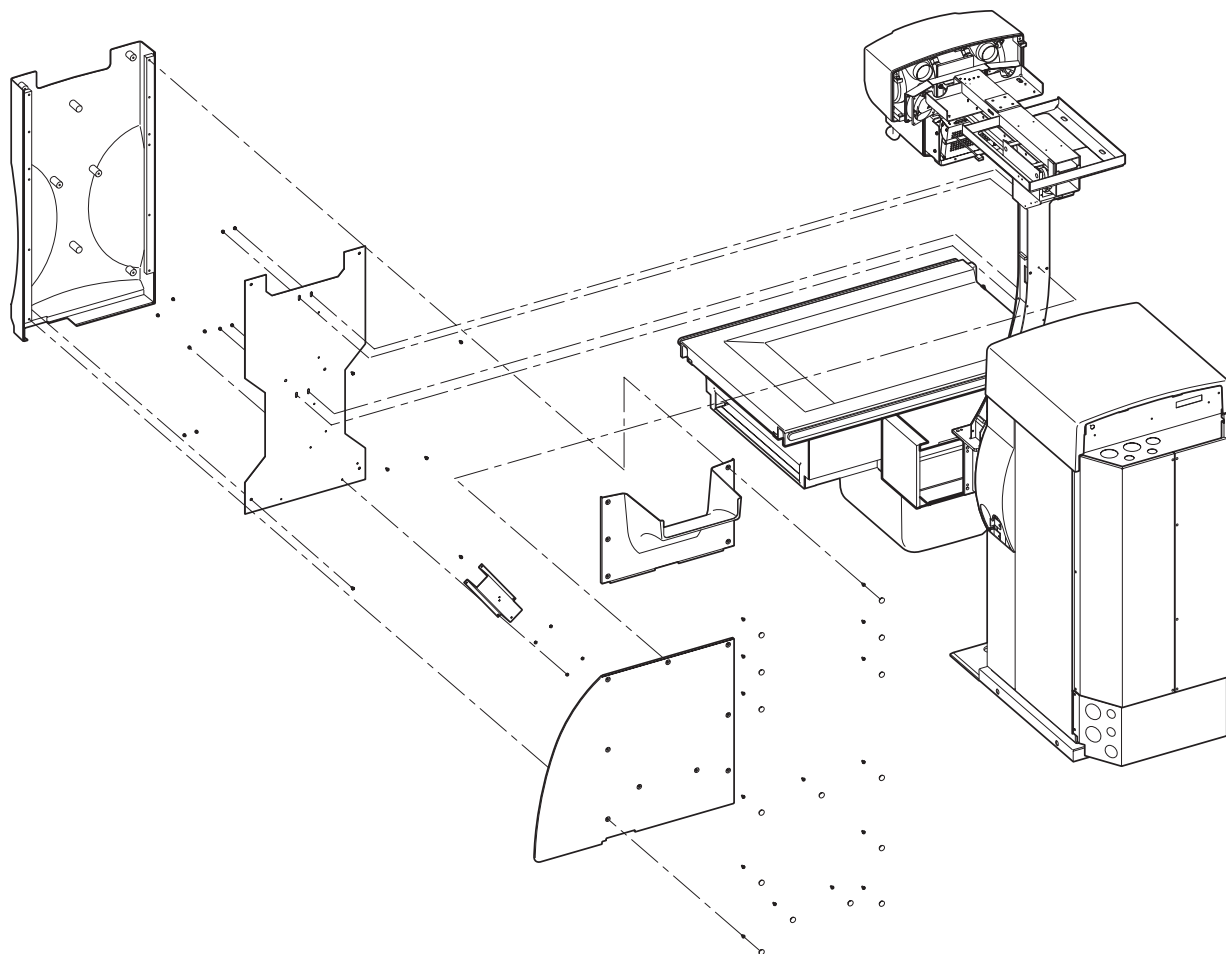
Remove the screw at the center of each half of the cover that extends downward to cover the Electronics Slide Assembly and cables.



X-Ray Support Arm

REAR PANEL

The rear panel cover of the X-ray Arm is attached to the top and bottom X-Ray Arm covers by six Torx-head screws. This cover is easiest removed and allows viewing of the remaining covers, cables and hardware towards the X-Ray head and tube area.

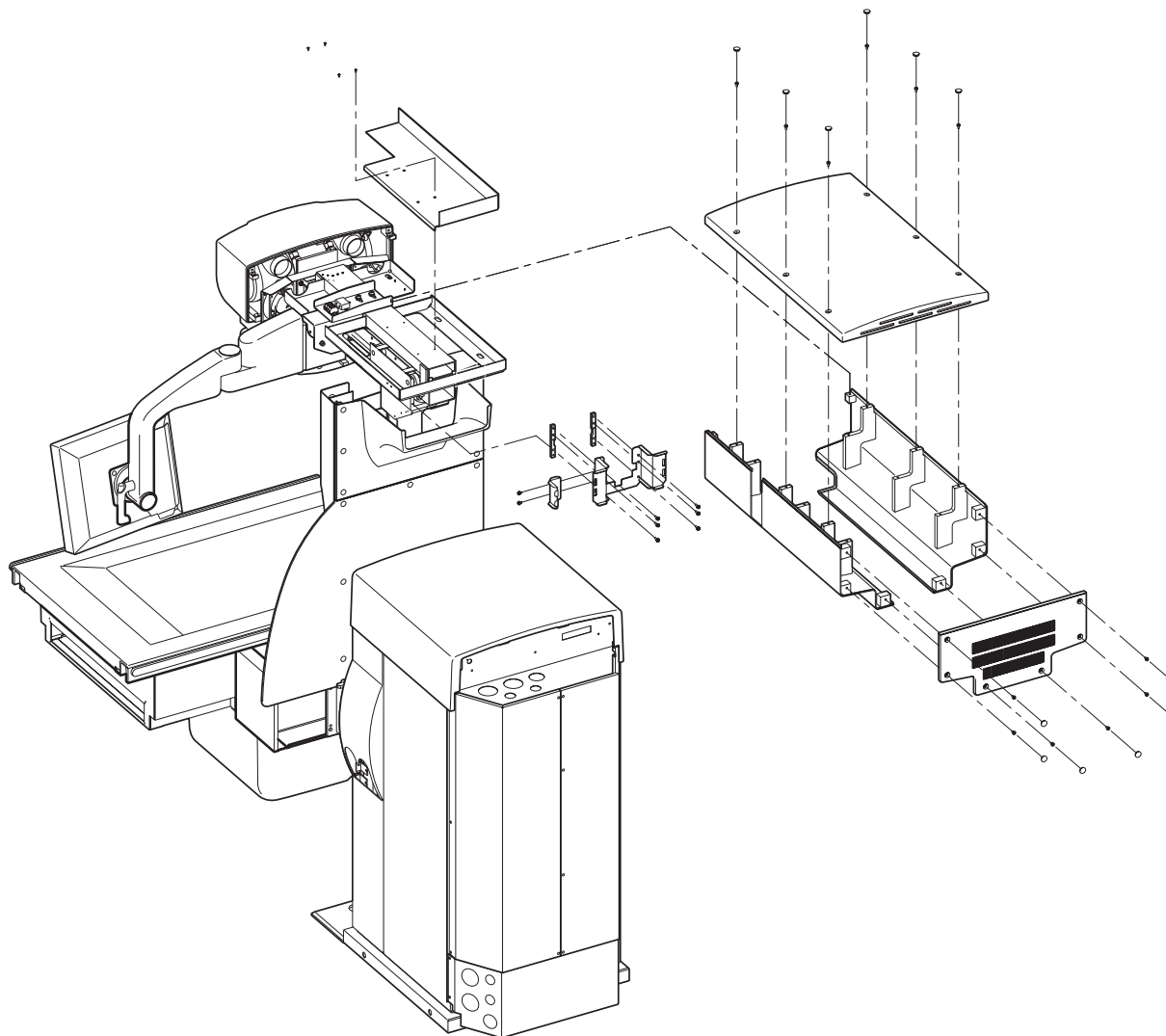


Top Arm

This cover must be removed first to gain access to the rear of the X-ray Arm. The cover is attached to the bottom cover blocks and arm bracket by six Torx-Head screws and lifts upward.

Bottom Arm

The bottom arm cover is attached to the X-ray arm by six bolts through a bracket attached to the X-ray arm. The blocks are fastened to the cover by screws. The cover has a slot on one side that mates with a groove in the flat panel display monitor arm. All arm covers overlap at the edges.



Vacuum Fluorescent Display

1. The Vacuum Fluorescent Display Cover not only covers the X-ray tube, but also the Collimator, Vacuum Fluorescent Display and other components. This cover should be removed for most servicing requirements.
2. Refer to the *Installation Manual* for steps used in removing the VFD Cover. These steps detail installing the cover, but should be used in reverse to remove the cover for servicing.

X-Ray Head

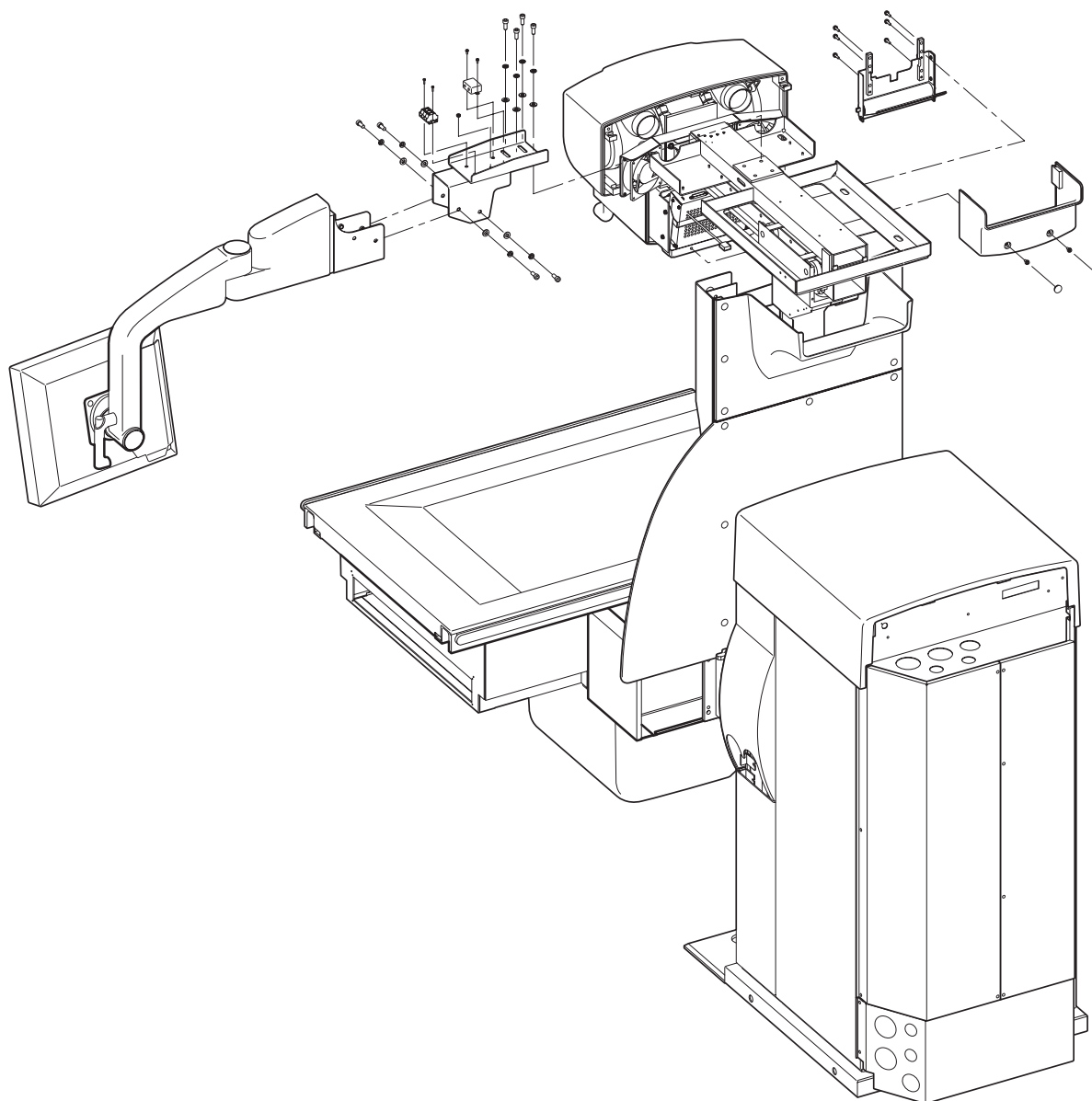
1. About an hour should be allotted for removing the X-ray head and the same amount of time for replacement, plus additional time for replacement of any parts within the head.
2. Before attempting to remove the X-ray head cover, remove the top and bottom X-ray Arm covers as described elsewhere in this section. Do not remove the VFD Cover as this cover will be used for X-ray head handling and protection of the X-ray tube.
3. The X-ray Head is removed from the X-ray Arm by first unplugging all connectors from the Collimator Control PCB chassis just behind the X-ray head.
4. Remove the X-ray Control PCB and chassis by removing two screws from the brackets on each side of the PCB chassis.
5. There are a number cables on top of the X-ray Arm, including the high voltage cables, and other power and signal cables for the X-ray tube that must be disconnected at this time.

Caution: *The X-ray head contains the X-ray tube and should be handled with care when the head is removed or replaced. The head is heavy and should be handled in accordance with approved Field Service methods.*

6. When the X-ray head is free of connecting cables, loosen the Allen-head set-screws on the X-ray Arm end channel and slide the X-ray head off of the end of the X-ray Arm.

Flat Panel Display Arm

1. A video cable and a +24-volt power supply are routed from the Flat Display to the X-ray Arm through the Flat Display Arm and must be disconnected before the arm is removed.
2. The flat panel display arm is attached to the tower frame by four bolts. The bolts are inserted into vertical flat metal brackets secured to the X-ray arm.



Flat Panel Display Monitor

1. The Flat Panel Display Monitor can be replaced without removing any covers from the X-ray Arm.
2. Open the access panel at the rear of the monitor and disconnect the video cable.

Replacement

3. Remove 4 screws mounting the flat panel to the monitor arm.
4. Replace the monitor using the steps above in reverse.

Table Covers

Splash and Crash

1. Tilt the table until it is in the vertical position with the image chain near the floor.

CAUTION: *Make sure the X-ray arm clears any obstructions when tilting the table vertically.*

2. Move the table upward so the Splash and Crash Cover is at a comfortable working height.
3. Remove three Allen-head screws located on the outside of the table (table front).
4. Remove eight plastic-covered Allen screws, leaving the screw at the top center of the cover for last.
5. With the cover supported, remove the last screw.
6. Unplug the cable to the microswitches on the cover, and re-connect to jumper, which is provided with the cable. Using the additional cable slack, set the Splash and Crash Cover aside.

Note: *The table will not boot without the jumper. You can skip the jumper if you don't need to operate the table with the Spash and Crash cover removed.*

7. To replace the cover, support it, disconnect from the jumper, and re-connect directly to the microswitches.
8. Lift the cover to the underside of the table and first replace the top center plastic covered Allen screw to hold the cover in place.
9. Replace the remaining plastic-covered Allen head screws and the Torx-head screws.

Image Intensifier Power Supply

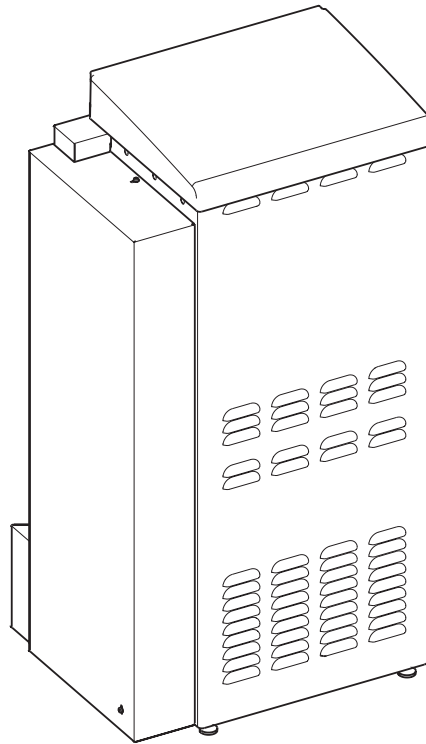
(See *Image Intensifier Installation* in the *Image Chain Component Replacement* section for II removal/replacement instructions.)

1. The Image Intensifier Power Supply cover is secured to the case of the II by two Philips-head screws, one on each side.
2. The power supply can be removed by disconnecting the cables and removing screws at each exterior corner of the power supply box.

Arm Lateral, and Cassette Carriage Drive Motors, and Arm Leadscrew

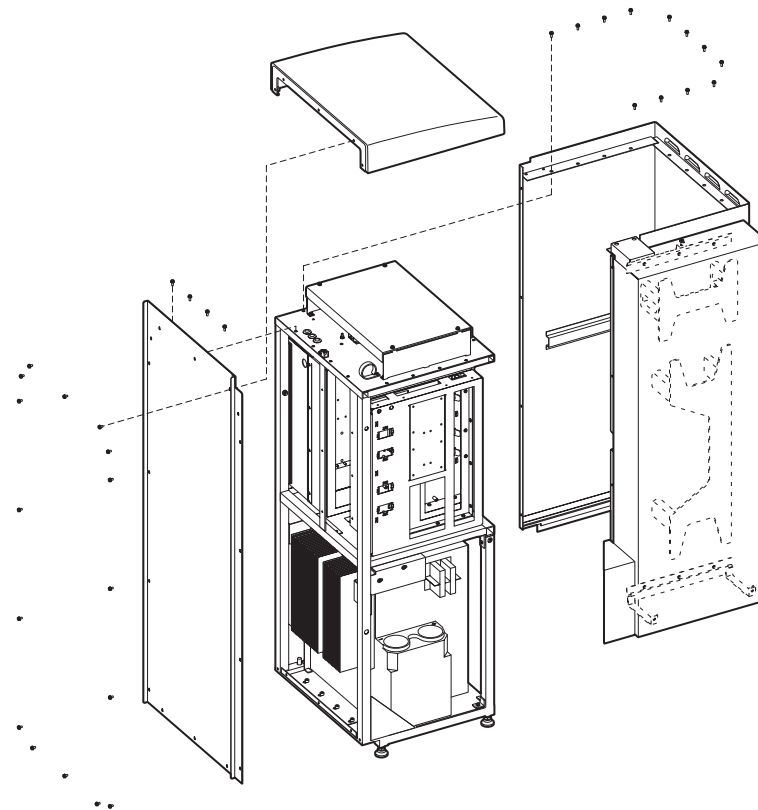
The Arm Lateral Motor, Film Cassette Motor and Arm Lead screw covers, both top and bottom, can be removed by removing the Allen Head screws on each end of the covers.

Generator Cover Configuration



Generator with covers





Generator Cover Removal

Cover Removal

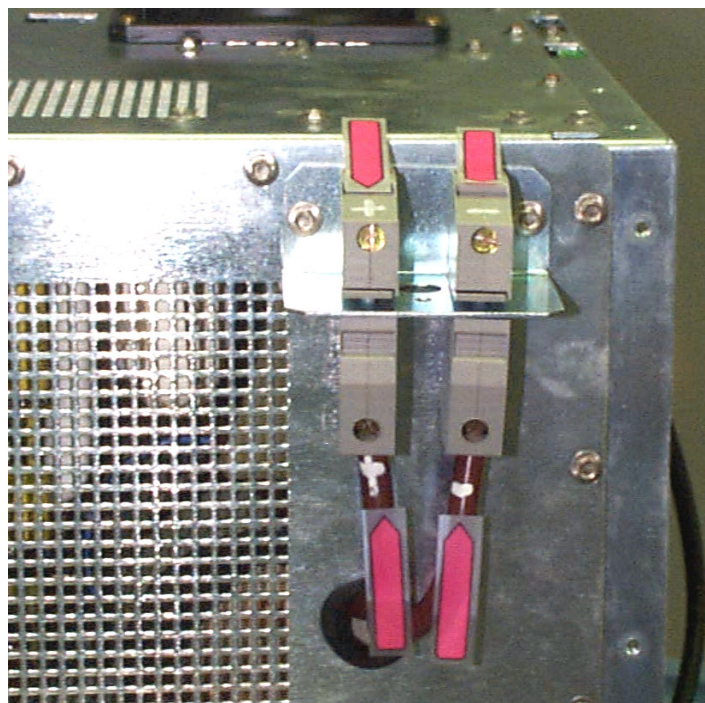
1. Make sure all power is off and tagged out before removing the generator covers.
2. Begin generator cover removal by removing the box cable cover from the side of the generator. Remove the excess cable from the holders to allow the generator cover to be removed.
3. Remove the five screws at the top rear of the cabinet. The top cover can then be removed, allowing access to the AC Power wiring and generator fuses.
4. On the inside of the main cover is a ledge containing 12 screws that secure the cover to the inside generator frame. Remove these screws.
5. Remove the 12 screws from the rear sides and bottom rear of the rear panel. Remove the rear panel and set it aside. The front cover is configured in a U-shape and can now be moved away from the generator.
6. After covers are removed, the top tier generator modules: AC/DC, Rotation and LVPS-400, are mounted on hinges and swing outward for service. Refer to the *Generator Module Locator Diagram* on the following page.
7. Move the module outward and disconnect all cables from the module to be replaced.

NOTE: When replacing the LVPS-400 PCB, make sure the cables plugged into the modules on either side are not disturbed.

8. Remove the 12 screws securing the metal module cover and remove the cover.
9. Locate and remove the mounting screws for the PC board to be replaced. Refer to the sections below that are specific to the PCB to be removed for special instructions. Refer also to the *Adjustments* section of the *X-Ray & ABS* section of this manual for PCB drawings showing mounting hole locations. Refer to specific instructions in this section for removal and replacement of each PCB from the mounting box.
10. After replacing the PCB, replace the cover and securing screws. Move the PCB box back to its original position and replace the generator covers.

WARNING:

After removing the generator covers, use a voltmeter (DC) to measure the 600 VDC bus voltage between the + and – terminals. Do not attempt to service the generator until the voltage reading is less than 2 VDC. See below.



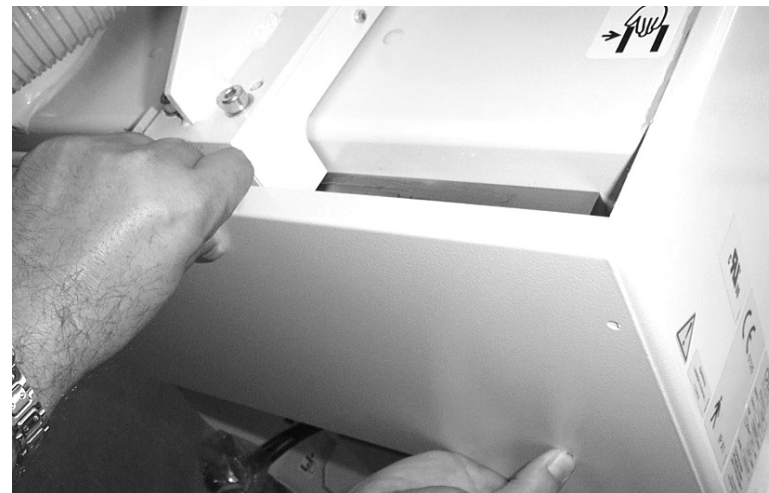
**Measure the voltage between the + and – terminals.
Proceed when voltage measured is less than 2 volts DC.**

X-Ray Arm Bearing Replacement

*Note: Refer to the Replacement section in the Service Manual for details **about cover removal**.*

1. Remove the all covers on the X-ray arm
2. Remove the splash and crash cover underneath the table.
3. Remove cover on bottom of the arm.

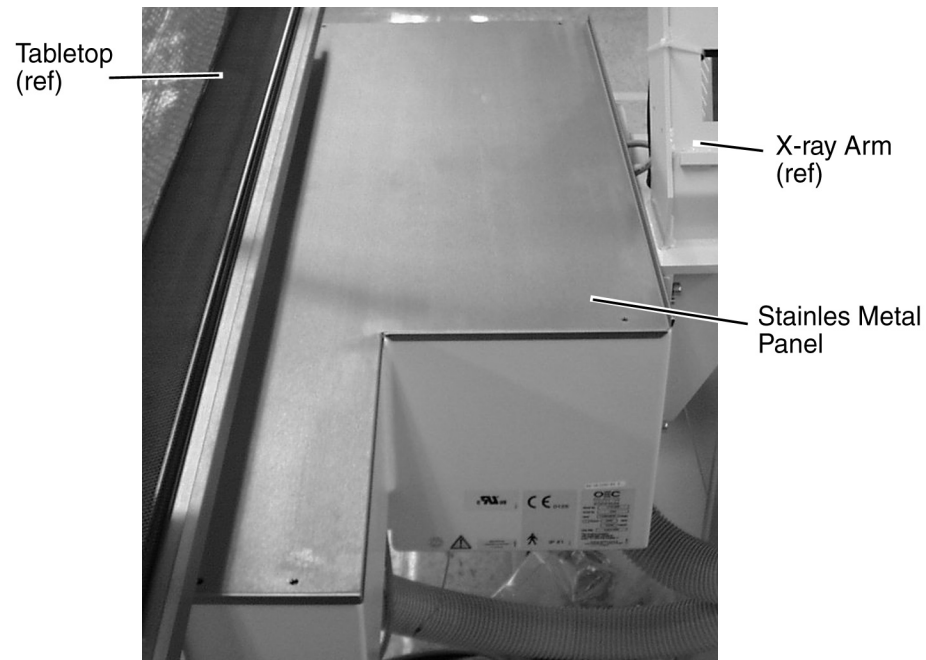
Remove Bottom Cover



3. Move tabletop laterally away from the tower.

Replacement

4. Remove the stainless metal cover on top of the table by removing five screws.



Remove Stainless Metal Cover

Replacement

5. Remove side covers around X-Ray arm drive.

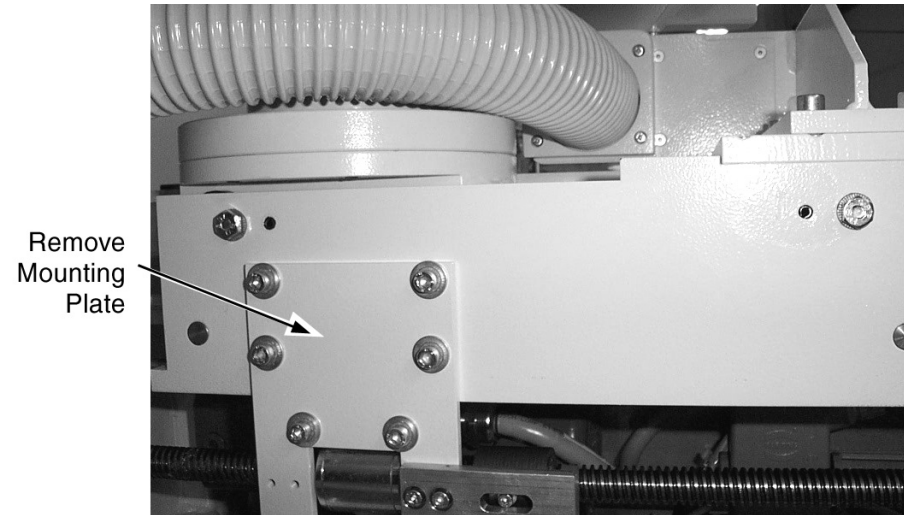
Remove
Side
Covers



Removing Side Covers

Replacement

6. Remove the mounting plate to the arm drive.

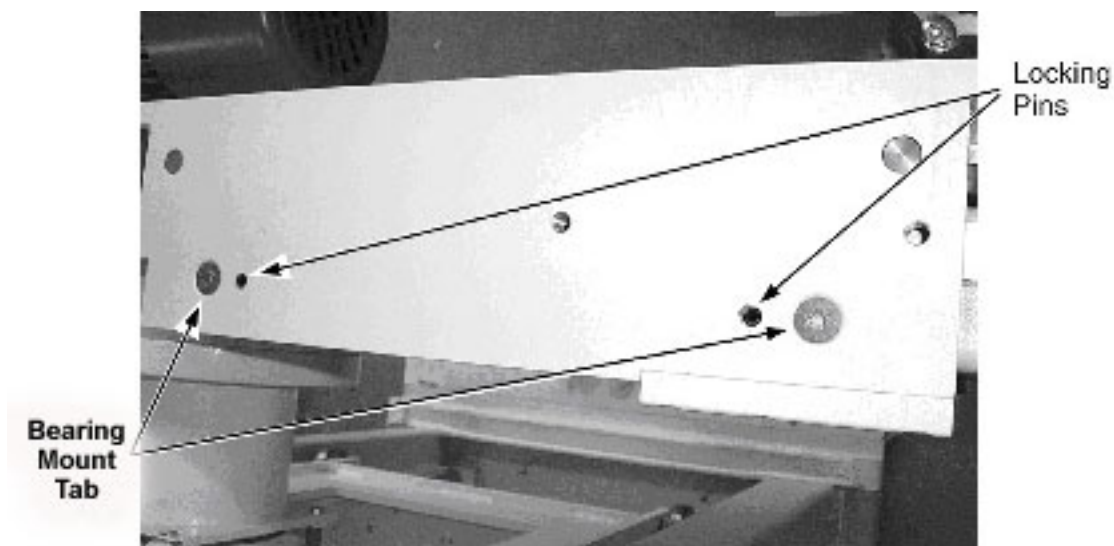


Remove Mounting Plate

7. Locate the upper or lower outside bearings, or inner bearings that need to be replaced and refer to the appropriate pages below.

Lower Outside Bearing Replacement

1. Remove the lower outside bearings by punching the locking pins out (next view).



Punch Out Locking Pins

Note: Tap on the bearing mount to lift it out of its position.

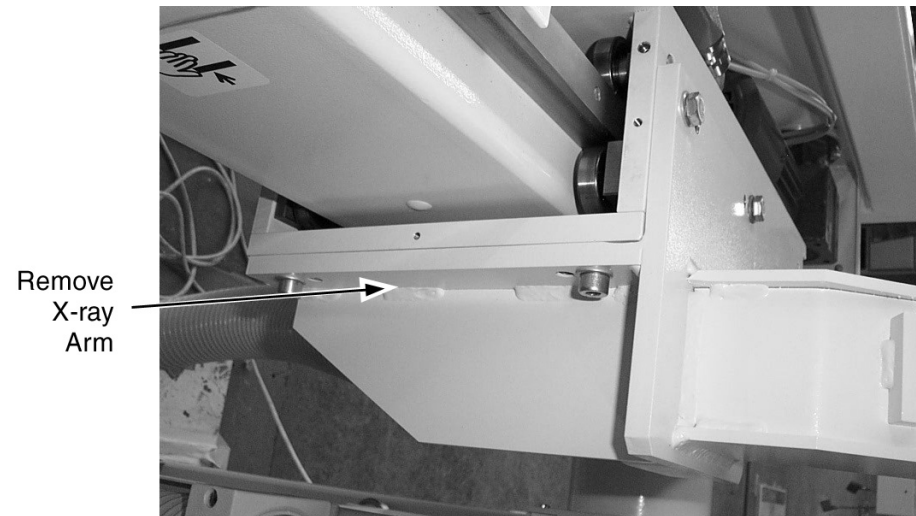
2. Replace the bearings and reassemble in reverse order.
3. Ensure the X-Ray arm is moving smoothly. Test for full functionality.

Upper Outside Bearing Replacement

Note: Before removing the arm you need to remove the x-ray tube and collimator.

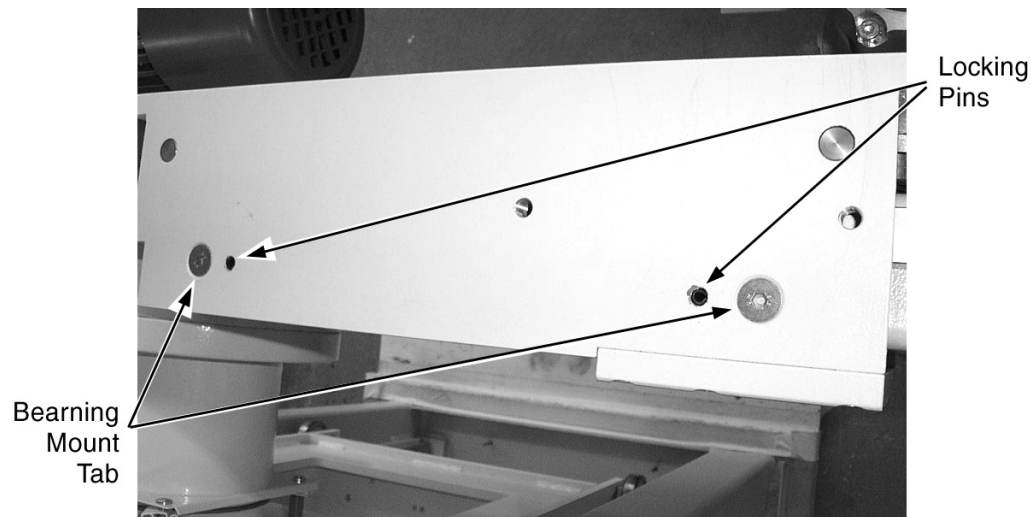
Warning: *The X-ray Arm is heavy and unwieldy. Do not try to remove it without help. Obey all pertinent Environmental Safety and Health regulations.*

1. Remove the X-ray arm to replace the upper outside bearings.



Remove X-ray Arm

2. Remove the upper outside bearings by punching the locking pins out.



Punch Out Locking Pins

Note: Tap on the bearing mount to drop it out of its position.

3. Replace the bearings and reassemble in reverse order.
4. Ensure the X-Ray arm is moving smoothly. Test for full functionality.

Inner Bearing Replacement

Note: Before removing the arm you need to remove the x-ray tube and collimator.

Warning: *The X-ray Arm is heavy and unwieldy. Do not try to remove it without help. Obey all pertinent Environmental Safety and Health regulations.*

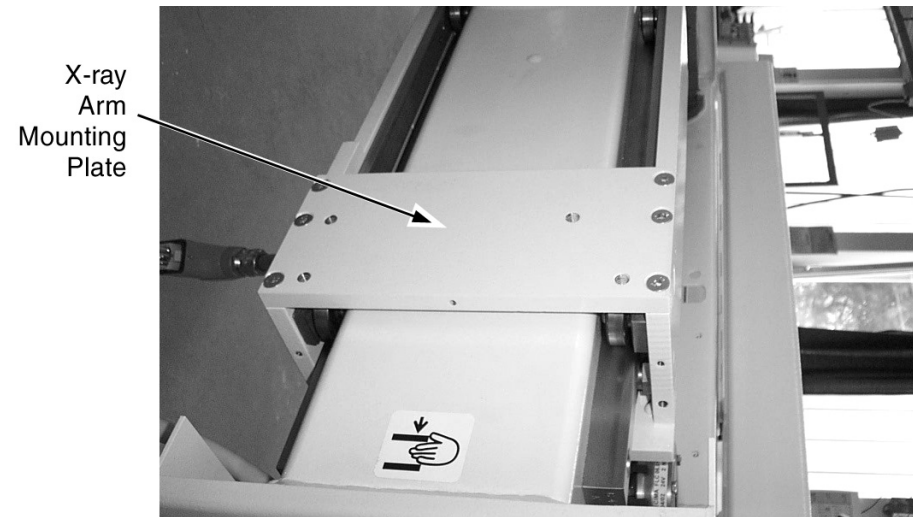
1. Remove the X-ray arm to replace the inner bearings (next view).



Remove X-ray Arm

Replacement

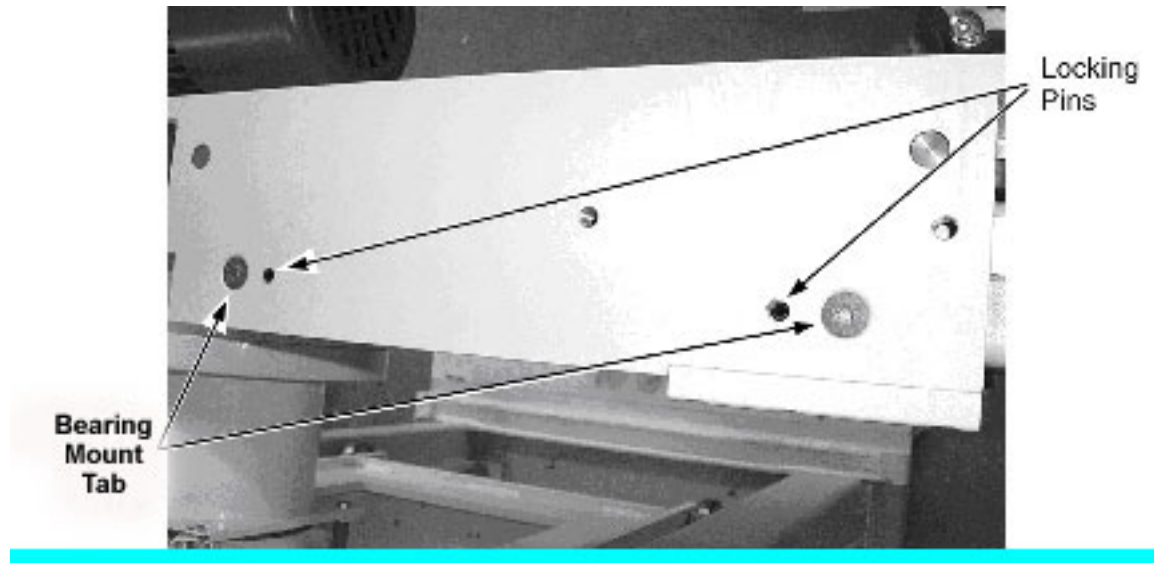
2. Remove the X-ray arm mounting plate.



X-ray Arm Mounting Plate

Replacement

3. Remove the lower outside bearings by punching the locking pins out.



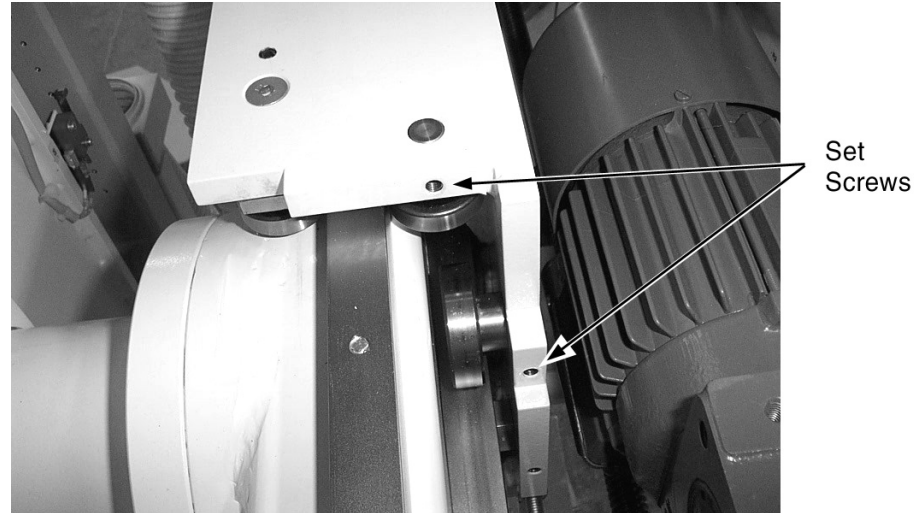
Punch Out Locking Pins

Note: Tap on the bearing mount to drop it out of its position.

4. Remove the upper outside bearings by punching the locking pins out.

Replacement

5. Remove the inner bearings by loosening the setscrews. There should be enough play now to drop the bearings.



Loosen Set Screws

6. Replace the bearings and reassemble in reverse order.
7. Ensure the X-Ray arm is moving smoothly. Test for full functionality.

Tower and Table Electronic Assemblies

Table Motion CPU PCB

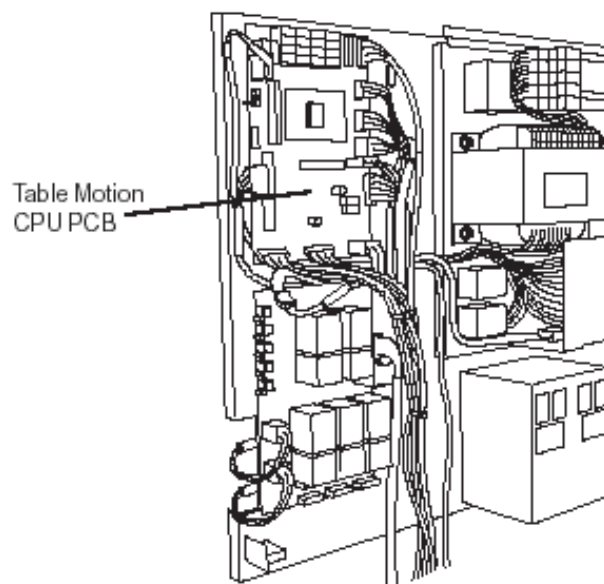
Version Update

The software on the Table Motion CPU PCB can be updated by replacing the PROM on the Central Processor Unit module. PROMs are CMOS components. Please observe the guidelines for EMI protection.

Removal and Replacement of the PCB

The Table Motion CPU PCB resides on the pull-out panel at the top rear of the OEC UroView® 2800 tower. The panel may be extended to either side to make component servicing convenient.

WARNING: *When moving the sliding panel outward from the tower, considerable effort is required. Use extreme caution in sliding it back into the tower as internal wiring could be accidentally snagged and cut.*



Location of the Table CPU PCB

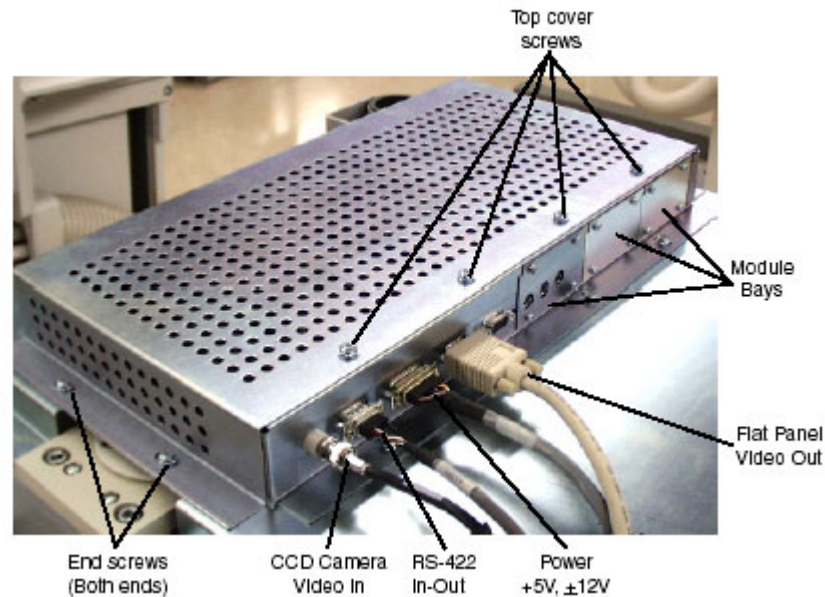
1. Upload table calibration files.
2. If applicable, separate generator from tower.
3. Remove the left side cover panel by removing the two screws at the bottom of the cover. Pull the bottom of the cover outward to disengage the top brackets from the tower frame. Set the cover aside.
4. Pull the sliding panel out toward the left side of the tower.
5. Remove EMI shield.
6. To replace the PCB, remove all plugs from the board.
7. Compress the plastic PCB mounts holding the CPU PCB to the panel to free the PCB and remove it.
8. Replace the PCB and plug in all cables.
9. Download table calibration files.

Relay PCB

The Relay PCB is located on the sliding panel at the rear of the tower just below the Table Motion CPU PCB. This board contains five relays that route power to five of the six motors in the table, under computer control.

Video Standards Converter

The Video Standards Converter (VSC) contains modules that convert the Hi-resolution OEC video (980 x 980) into standard SXGA analog video format (1280 x 1024) to be used in conjunction with the OEC Uroview® 2800 System Flat Panel monitor and other OEC products. Various VSC modules are available to convert other video signal inputs such as NTSC/PAL as well as other “computer standard” inputs. The inputs are converted to SXGA for display on the 2800 Tower monitor and provide the picture-within-picture capability for the system. The various modules can be mounted in any of the three bays and are plugged into a motherboard for power, communications and video connections to and from the system.

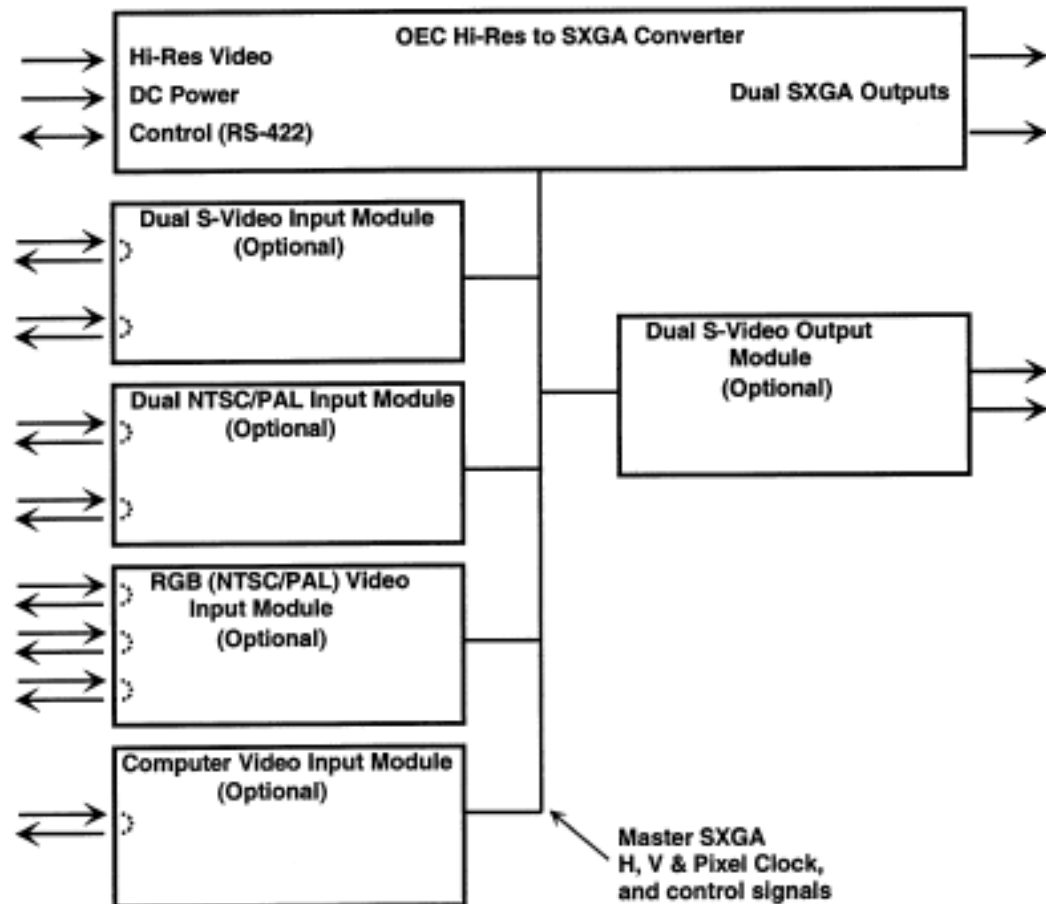


Video Standards Converter (under top tower cover)

WARNING: When disconnecting a module from the motherboard, be sure to lift the end opposite the external connector plugs and work the pins of the card connectors out of the motherboard connectors. If the module is lifted from the external connector end, the PCB could flex and break.

The connectors on the VSC modules allow identification of the module installed within the enclosure. Refer to the Uroview® 2800 Installation Manual for details on module identification and installation.

VIDEO STANDARDS CONVERTER MODULE MAP



Frequency Inverters

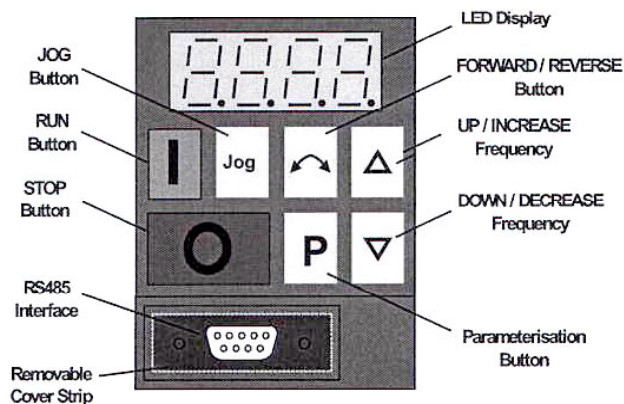
Two Siemens Frequency Inverters used for Lift-Tilt motor speed control are located in the upper tower area on the rear pull-out CPU panel behind the Lift and Tilt drive mechanism. The units are located on the lower right-hand corner of the panel and have a four-figure readout on the front panel as shown above. The inverters are located under a protective metal cover secured by four screws, two on each side of the units. The table software automatically downloads most of the inverter settings. The setting that must be entered by hand are listed below, along with front panel operation instructions.











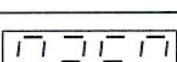





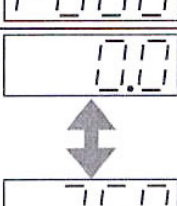
Parameter	Function	Setting	
		U1	U2
P 009	Parameter Protection	3	3
P 091	Slave Address	0	1
P 092	Baud Rate	7	7
P 095	USS Compatibility	2	2
P 910	Mode	1	1

Replacement

The parameter settings required can be entered using the three parameterisation buttons (P, Δ and ∇) on the front panel of the inverter. The parameter numbers and values are indicated on the four digit LED display.



Δ	Press to INCREASE frequency. Used to change parameter numbers or values to higher settings during the parameterisation procedure. Disabled if P124 = 0.
∇	Press to DECREASE frequency. Used to change parameter numbers or values to lower settings during the parameterisation procedure. Disabled if P124 = 0.
P	Press to access parameters. Disabled if P051 - P053 = 14 when using digital inputs. Press and hold to access higher resolution for some parameters. See section 5

Step /Action	Button	Display
1. Apply mains power to the inverter. The display will alternate between the actual frequency (0.0 Hz) and the requested frequency setpoint (5.0 Hz default).		
2. Press the parameterisation button.		
3. Press the Δ button until parameter P005 is displayed.		
4. Press P to display the current frequency setpoint (5 Hz is the factory default setting).		
5. Press the Δ button to set the desired frequency setpoint (e.g. 35 Hz).		
6. Press P to lock the setting into memory.		
7. Press the ▽ button to return to P000.		
8. Press P to exit the parameterisation procedure. The display will alternate between the current frequency and the requested frequency setpoint.		

Note: If you need to change any parameters higher than 9, you must first set Parameter 9 to 3.

Electronics Slide Enclosure (Backpack)

The Electronics Slide Enclosure (Backpack) resides on the rear panel of the tower and serves as an enclosure for the power supplies, circuit breakers, and relays, plus power cable receptacles and BNC connectors for system signal connections.

The Electronics Slide Enclosure is attached to the tower rear panel by a slide rail that allows the panel to move to the left or right for servicing of internal components.

WARNING: *When moving the sliding enclosure outward from the tower, considerable effort and care is required. Use extreme caution in sliding it back onto the tower as internal wiring could be accidentally snagged and cut.*

Note: Circuit Breakers CB1 and CB2, mounted in the Electronics Slide Enclosure, control the following:

CB1 = Controls Table and LVPS-400 Power. Displays a "Generator Communications Error" on the Vacuum Fluorescent Display when turned OFF.

CB2 = Controls power to the Workstation. The system will not power up if in the OFF position.

Refer to the *Power Distribution* section of this manual for details of other components contained within the enclosure.

Table Potentiometers and Limit Switches

Table Longitudinal Movement Potentiometer

Lift up the tabletop (Fig. G - 2) (it will be held in place by the gas spring) and remove the cover panel (Fig. G - 1).

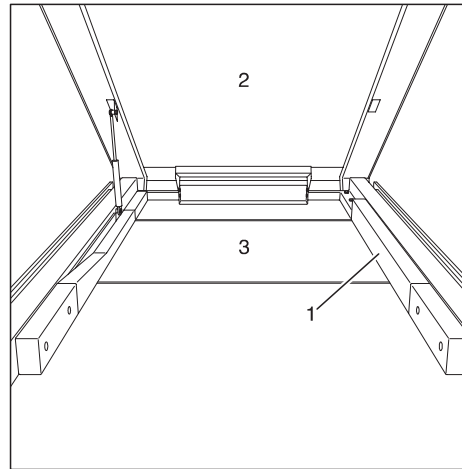


Figure G

Move potentiometer (Fig. H - 1) away from the pinion rack, move the tabletop into the centered position. Turn the potentiometer to the middle position, and mesh it back into the pinion rack. Align the pinion on the rack and check the function over the entire movement path. Reinstall the cover panel.

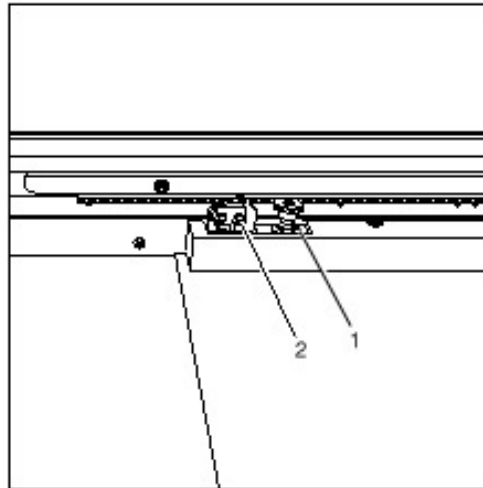


FIGURE H

Lateral Pot Replacement

1. Remove the splash and crash cover.
2. Remove the bottom cover on the head end of the table.



Bottom Cover Removal

3. Connect Laptop to the service port on the Motron bd.
4. Flip the service switch in the service mode position.
5. Open Utility Suite and run the Motron Tool.
6. In the service menu select Axis Calibration and then Cassette.
7. Use the hand switch and move the cassette carriage into the exposure position by pressing the #1 save button (Button #3 moves the cassette carriage back to the load position).

Replacement

8. Access the pot from the bottom and through the cassette carriage door (See Below).

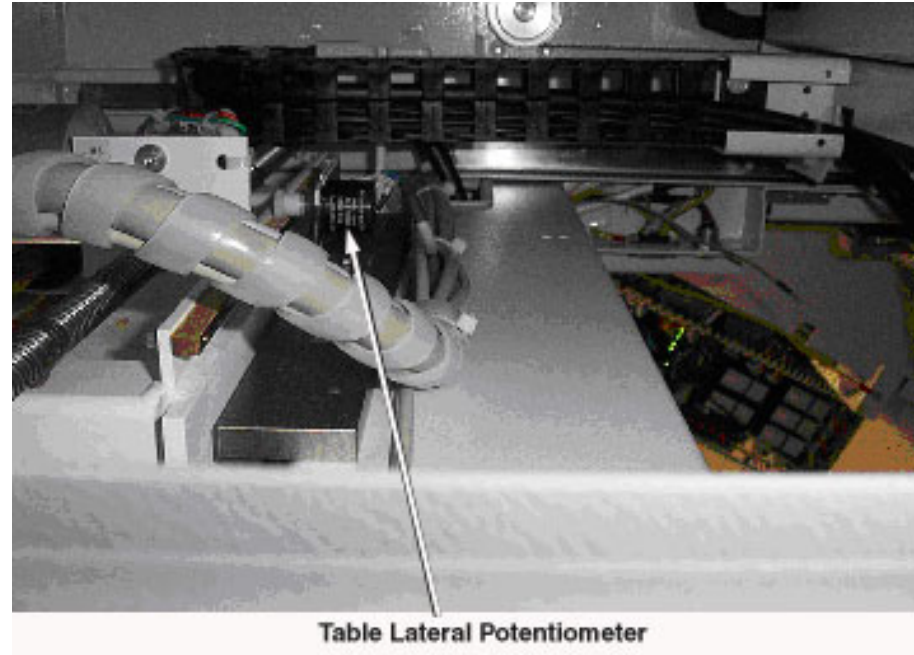
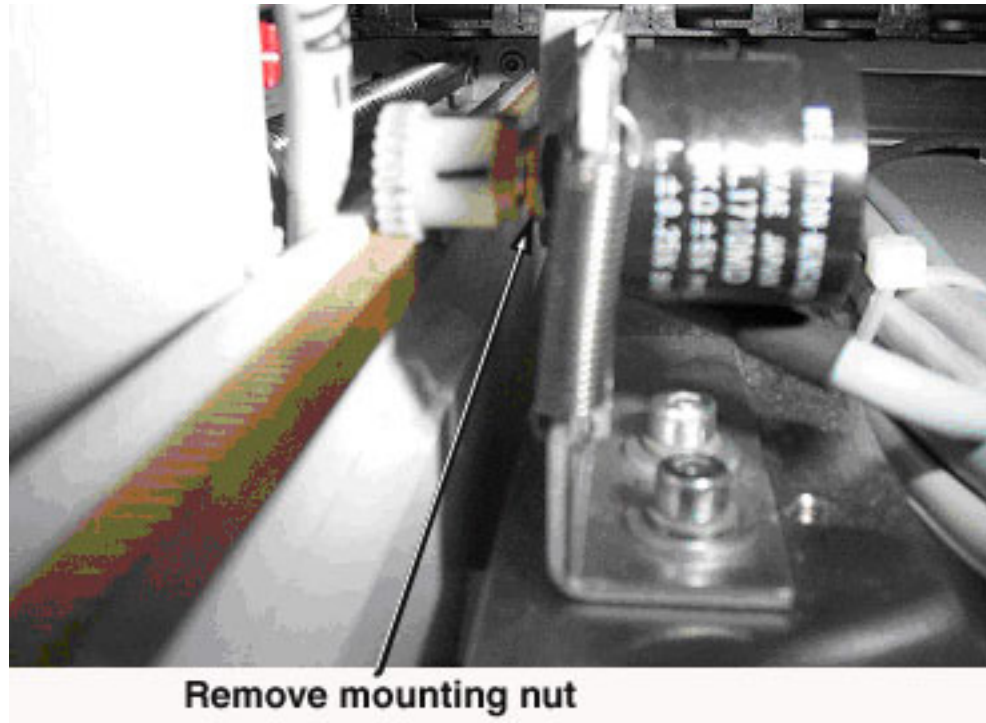


Table Lateral Potentiometer Mounting Position

Replacement

9. Remove mounting nut to remove pot from bracket by sliding it upwards of the bracket. Unsolder cables. (See Below)



Lateral Potentiometer Mounting Nut

10. Install new potentiometer.
11. Adjust pot by following this procedure:
 - A. Center the table laterally
 - B. Lift up the potentiometer.
 - C. Turn the potentiometer to the center position. Verify with Ohm meter or access Motron Tool and set pot to read 500 in the analog test window.

Replacement

- D. Verify that gear is in center of the rack.
 - E. Check that the spring function leaves some play over the entire motion.
 - F. Verify functionality and perform software calibration. Refer to Calibration section of Service Manual for details.
- 12. Put everything together in reverse order.
 - 13. Perform system test and ensure that everything is functioning properly.

Elevation/Tilt Potentiometer R1/R3 Replacement

- 1. Remove side covers on tower. If the generator is mounted to the table remove the generator as well (see photo below).

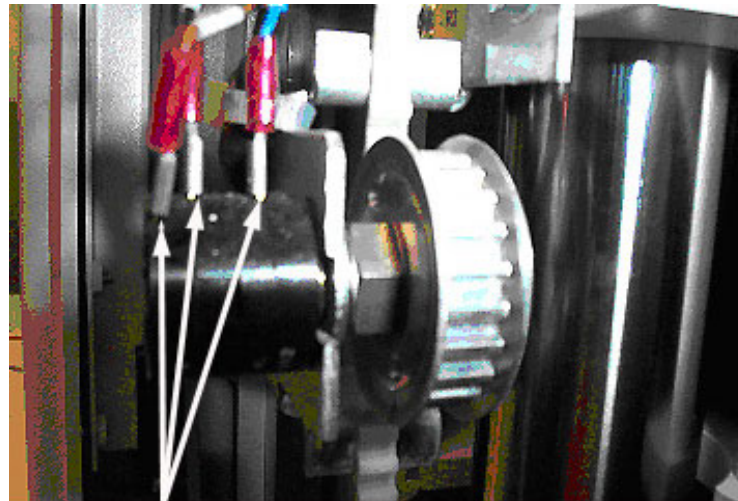


Elevation/Tilt Potentiometer

Elevation/Tilt Potentiometer Mounting

Replacement

2. Remove the potentiometer from the mounting bracket by loosening the mounting nut and disconnecting the lead wires (see below).



Wires

Potentiometer Wires

3. Install new potentiometer and reconnect cables.
 4. Move table to maximum elevation and tilt.
 5. Turn potentiometer to mechanical end position then back-up half a turn.
- Note: Ensure that you turn the potentiometer in the correct direction!*
6. Run table calibration in Motron Tool. Refer to Calibration section in the Service Manual for details.
 7. Reassemble system in reverse order.
 8. Perform functional test to ensure proper operation.

Table Potentiometer Belts

The Table Potentiometer belts are secured at the top and bottom of the tower by two Allen-head bolts and a metal clamping bar. To change a belt, loosen both bolts on the top and bottom and slip the belt from under the clamping bar. Secure the belt at the top, then rethread the belt through potentiometers R1 or R3 and pull the belt taught at the bottom before tightening the Allen-head screws.

Be sure to perform the potentiometer adjustments above after replacing a belt.

Table Microswitches

Table Longitudinal Safety Switch

Lift up the tabletop (it will be held in place by the gas spring) and remove the cover panel (Fig. N - 1). Set the software end positions to 240 +/- 5 mm in each direction. Adjust the limit switch (Fig. O - 2) so that it switches off approx. 3 – 5 mm behind each end position. To do this, either the limit switch or the switch strike place can be adjusted. Check the function over the entire movement path and reinstall the cover panel.

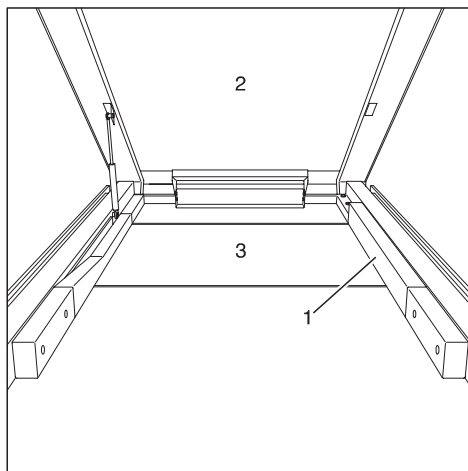


Figure N

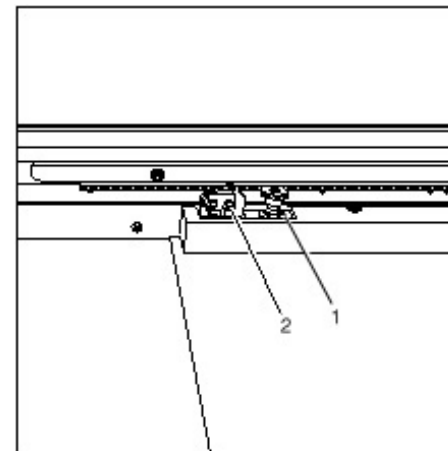


Figure O

Table Up Movement Switch Strike Plate

Raise the table to max. 1225 ± 10 mm position. When the software limit is set, the top switch strike plate (Fig. P - 1) should be adjusted so that the limit switch (3) actuates approx. 2 - 5 mm below the maximum height.

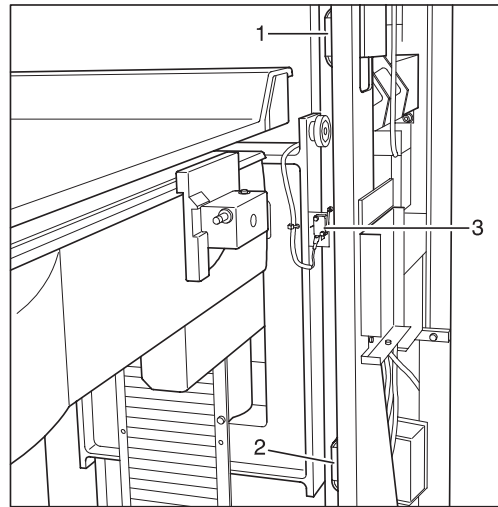


Figure P

Table Down Movement Switch Strike Plate

Lower the table to the minimum 680 ± 10 mm position. When the software limit is set, the bottom switch strike plate (Fig. P - 2) can be adjusted so that the limit switch actuates approximately 2 - 5 mm above the minimum height.

Tilt Movement -20° Safety Switch

Tilt the tabletop into the -20° end position. The limit switch (S3) (Fig. Q - 2) floating switch striker plate is the bronze slider. The floating switch striker (Fig. Q - 1) should actuate the microswitch approximately 2 mm before the end position (2).

Tilt Movement +88° Safety Switch

Tilt the tabletop into the +88° end position. The limit switch is for tilt movement and the floating switch striker is the bronze slider. The floating switch striker (Fig. Q - 1) should actuate the microswitch (Fig. Q - 2) approximately 2 mm before the end position.

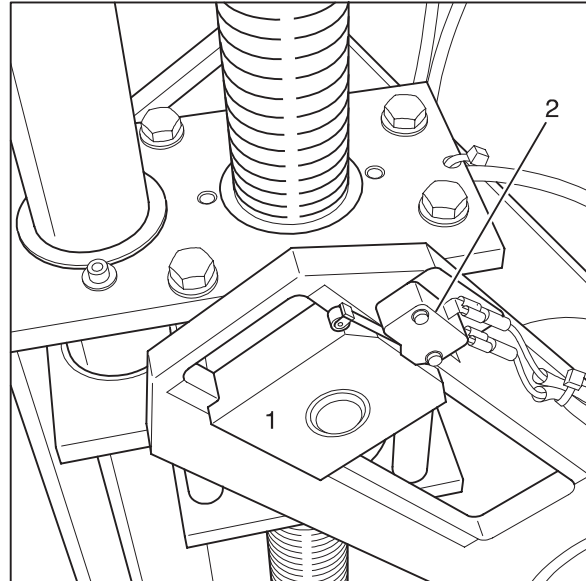


Figure Q

Note: Safety switch shown may be either the -20° or the +80°, depending on whether the table is left-hand or right-hand.

Spindle Nut Safety Limit Switch

The safety nut (Fig. R - 1) must be installed centered in the bottom half between the two steel plates (2+3).

The switch strike plate in the microswitch with the roller must be up against the safety nut and actuated; when the safety nut moves up, the microswitch responds and the switch circuit is interrupted.

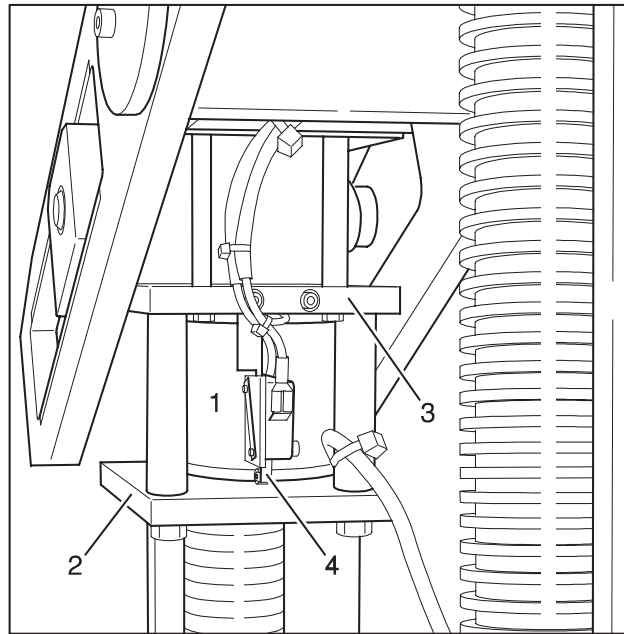


Figure R

Accessory Sensor Switches

Securely and audibly insert the table extension or the micturation seat into the opening.

The corresponding microswitch is for sensing of the S17 table extension (Fig. S - 1) and S18 is for the micturation seat (2). The switch strike plate must be adjusted so that it is on the tip of the nib so that any play will trigger a positive response of the S16 microswitch (3).

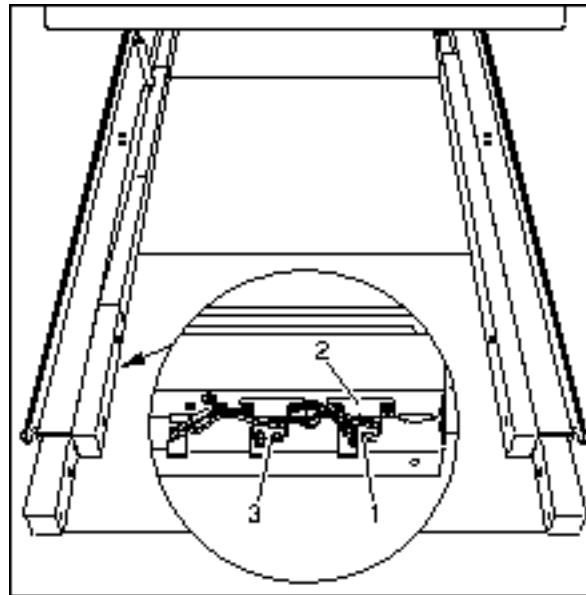


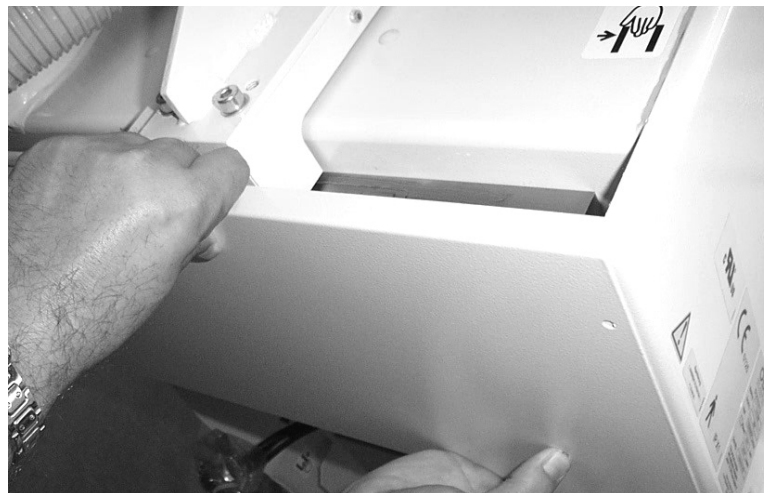
Figure S

Table Motor Replacement

X-Ray Arm Motor M2 Replacement

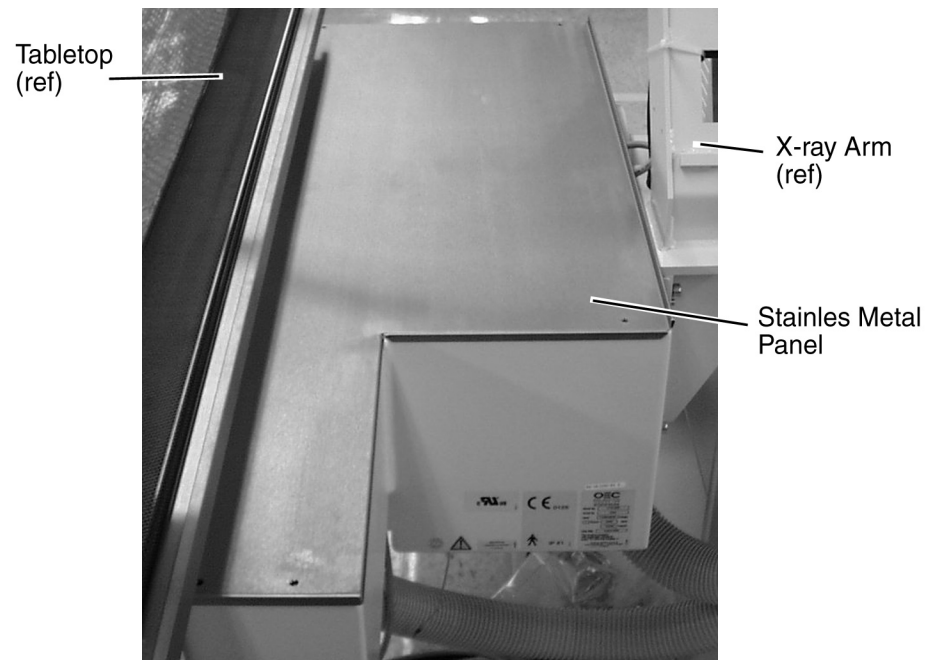
Note: Refer to the Replacement section in the Service Manual for details **about cover removal**.

1. Remove the all covers on the X-ray arm
2. Remove the splash and crash cover underneath the table.
3. Remove cover on bottom of the arm.



Remove Bottom Cover

4. Move tabletop laterally away from the tower.
5. Remove the stainless metal cover on top of the table by removing five screws.



Remove Stainless Metal Cover

Replacement

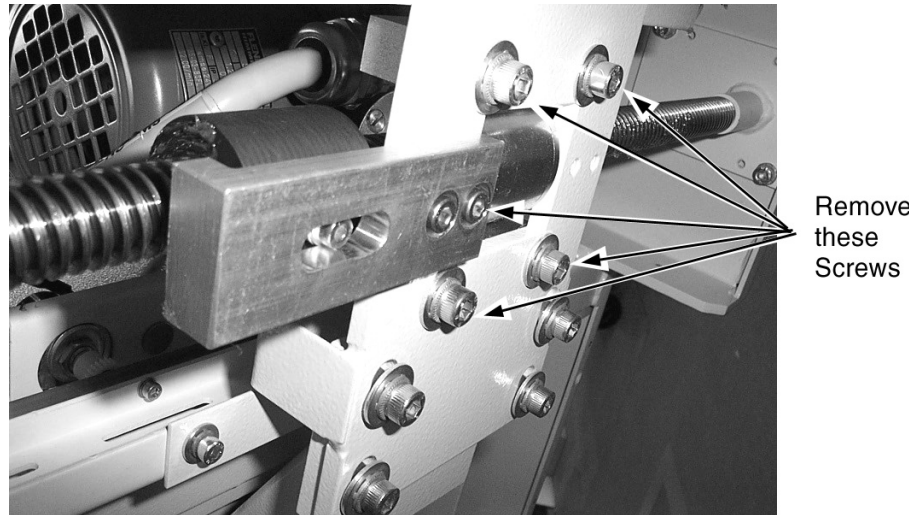
6. Disconnect connector X2 from motor M2.



X2 Connector Location

Replacement

7. Disconnect the arm from the worm gear underneath the table.



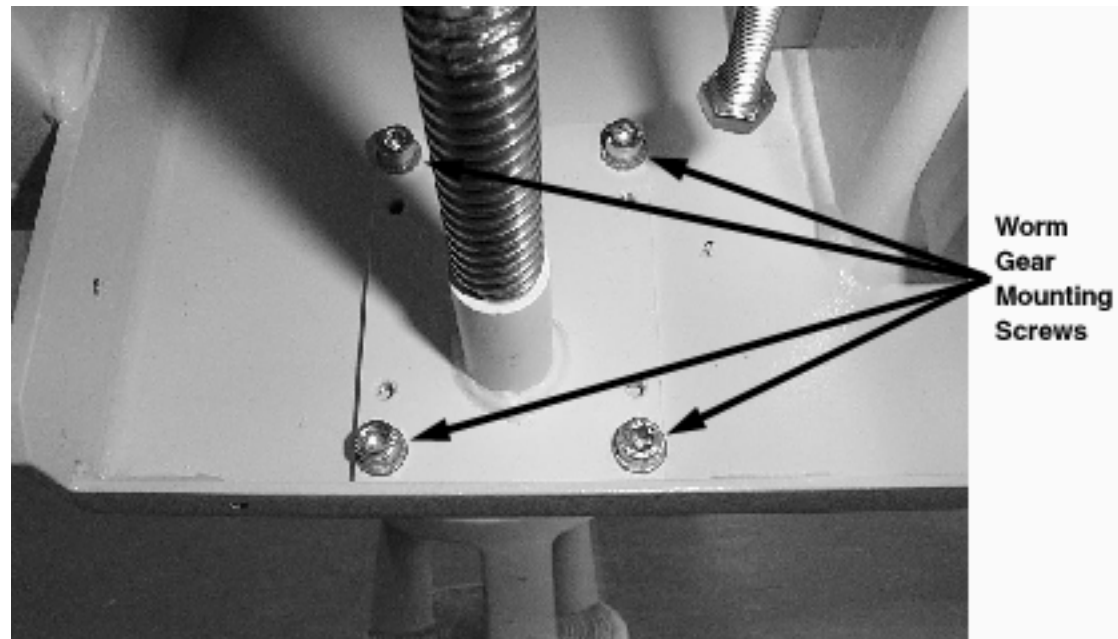
Remove Screws

Replacement

8. Remove worm gear mounts, four screws each side. Access from underneath the table.



Worm Gear Mounting Screws (one side)



Worm Gear Mounting—the other side

9. Lift out the motor.
10. Install motor and reassemble in reverse order.
11. Perform system test to check functionality. Verify calibration including film alignment.

Note: Refer to the Calibration section of the Service Manual for details.

Elevation /Tilt Motors M1 and M3 Replacement

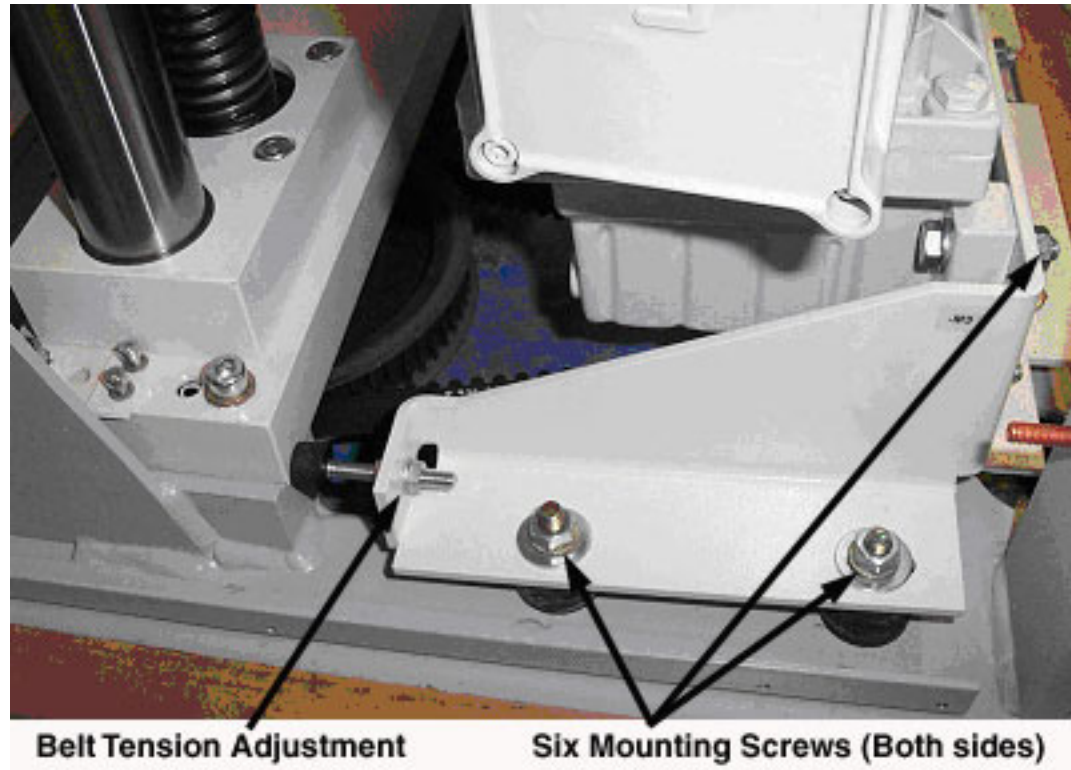
1. Prop both ends of the table.
2. Remove side and rear covers on tower. If the generator is mounted to the table remove the generator as well.
3. Disconnect Motor M1 (Vertical Tilt A) and/or M3 (Vertical Tilt B) from Relay PCB (See *Relay PCB Connectors* below).



Relay PCB Connectors

Replacement

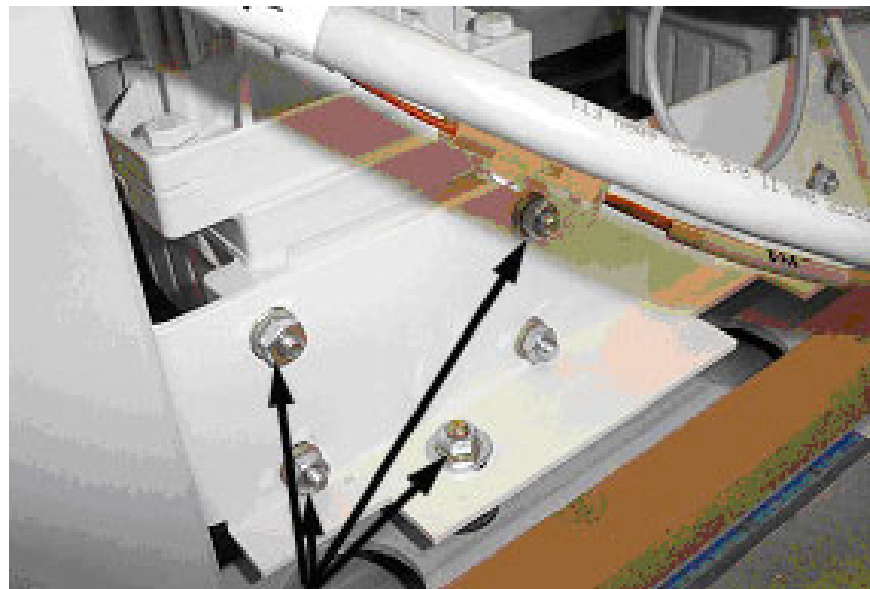
4. Loosen the six screws for the mounting bracket (See *Mounting Bracket Screws* below).



Motor Mounting Screws

Replacement

4. Loosen the belt tension and remove belt from Motor pulley (Refer to photo above).



Four Motor Mounting Screws

Motor Mounting Screws

Note: Mark the position of the motor because the mounting holes are elongated.

5. Remove motor by removing the four mounting screws (See above photo).
6. Install new motor, re-connect lead wires, and line up the gears with the belt.
7. Adjust the belt tension.

Note: Measure the tension with a spring balance on the belt in the center between the pulleys. A force of 80 N (18 lbs) should be measured for a belt movement of 10 mm (3/8").

8. Check elevation and tilt motion for smooth function and verify if calibration is still ok.

Replacement

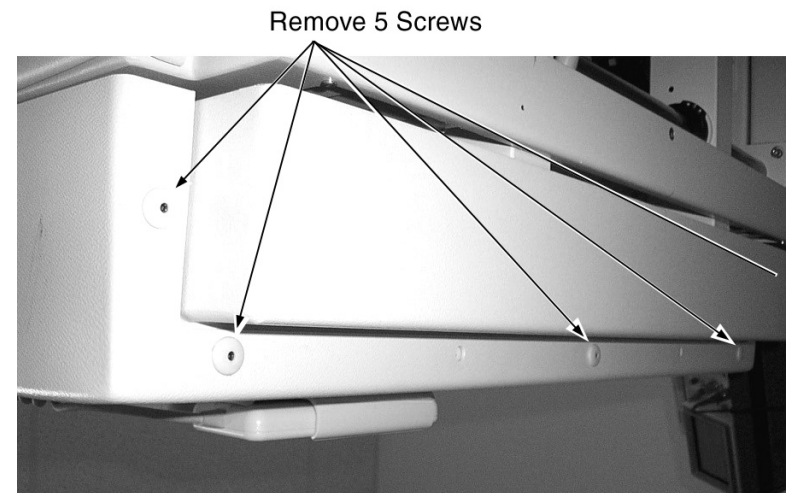
9. Reassemble in reverse order.
10. Perform functional test to ensure proper operation.

Table Longitudinal Motor M4 Replacement

1. Remove cover on head end of table by removing five screws from bottom.



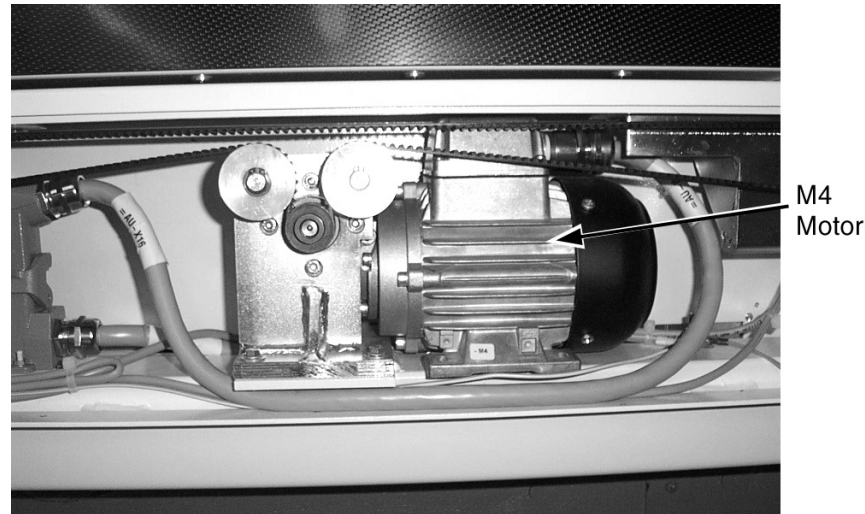
Head end of table



Remove Five Screws

Replacement

2. This gives access to the longitudinal drive area (see below).



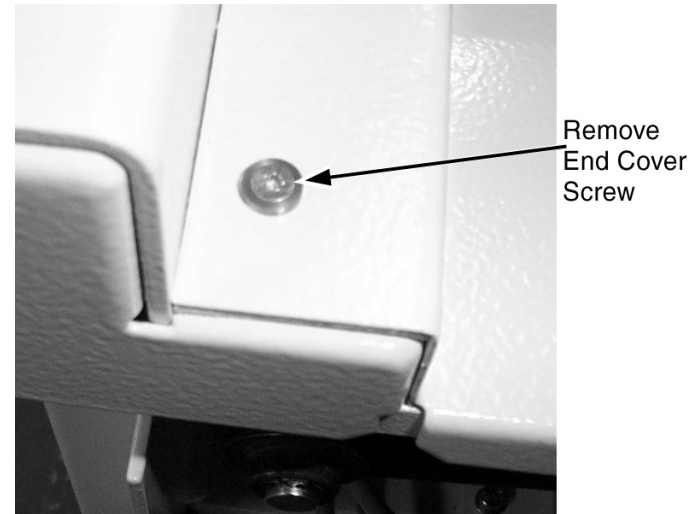
Longitudinal Drive Area – M4 Motor

3. With the table in its center position, drive table about 3-inches towards foot end.
4. Remove small end covers by removing one screw on each side (see next page).

Replacement



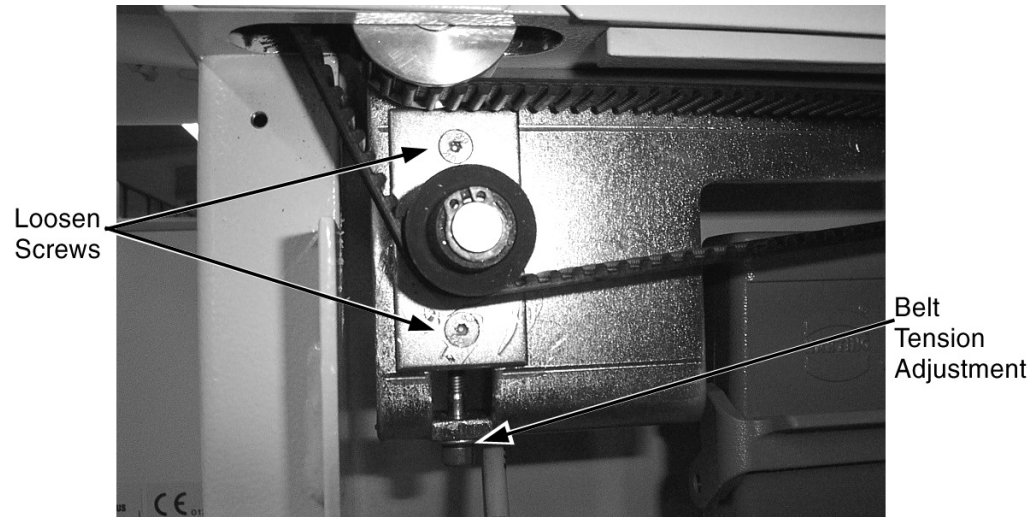
Small End Covers



End Cover Screw

Replacement

5. Loosen screws above and below the black rollers on left and right side of table

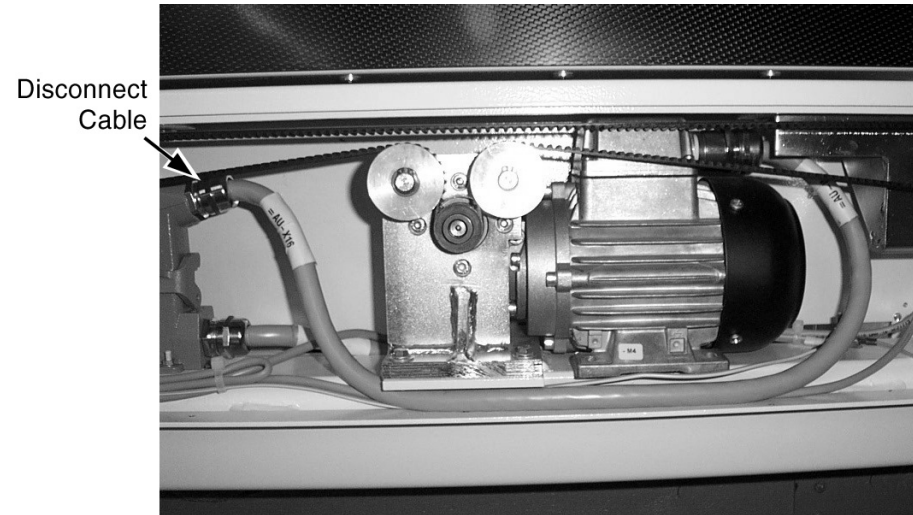


Screw Location and Belt Tension Adjustment

6. Loosen the belt tension by adjusting screw on bottom on left and right side of table (see above) then remove it.
7. Remove belt.

Replacement

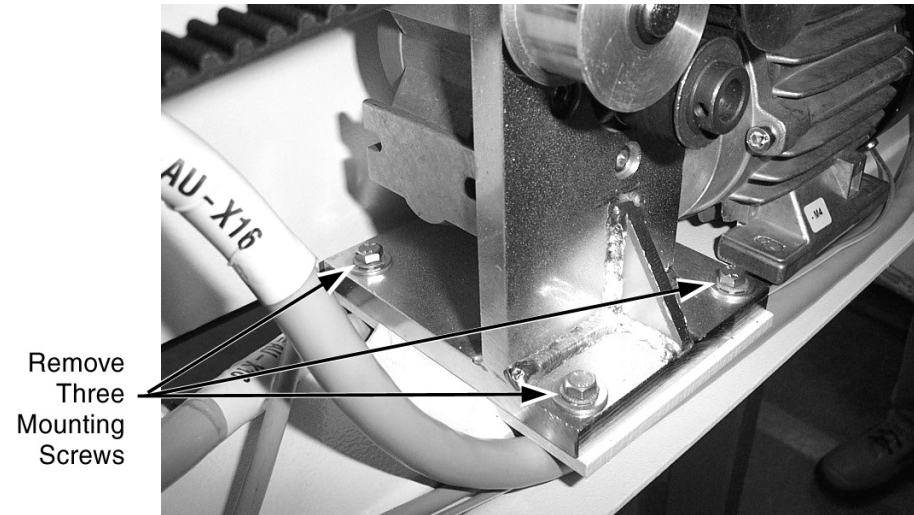
8. Disconnect cable from connector (see below).



Disconnect Cable from Connector

Replacement

9. Remove three mounting screws to remove motor M4 (see below).



Remove Three Mounting Screws

10. Replace motor and reassemble in reverse order.

Note: The belt tension should be adjusted that a force of 35 N (8 lbs) allows the belt to travel 8 mm (5/16") measuring with a spring balance in the center between the pulleys.

11. Perform functional test to ensure proper operation

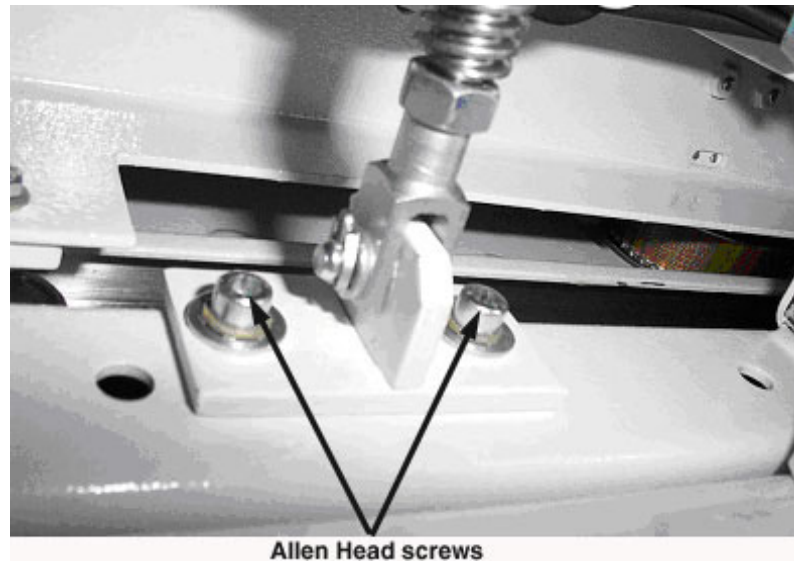
Lateral Motor M6 Replacement

1. Remove the Splash and Crash cover.
2. Remove bottom cover on head end (see Bottom Cover Removal below).



Bottom Cover Removal

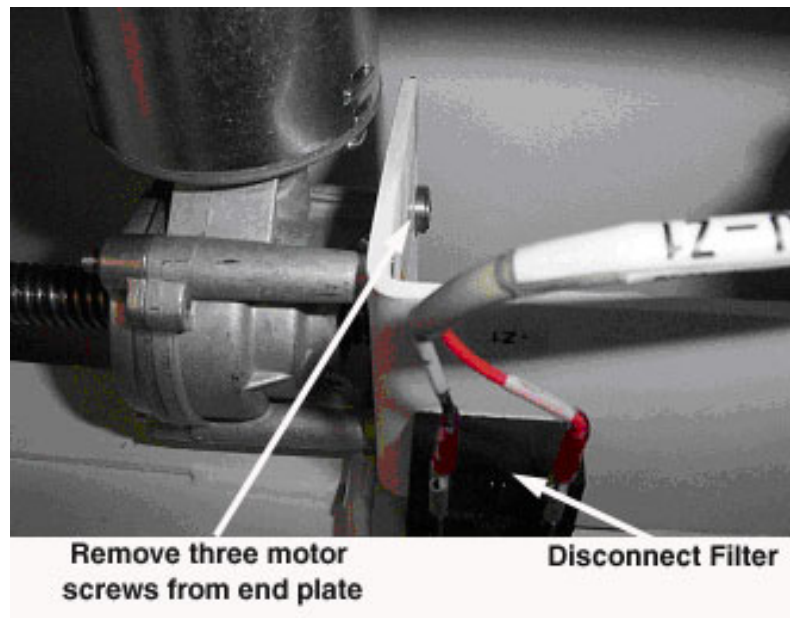
3. Remove worm gear mount by removing two Allen screws. (see *Worm Gear Mount Removal*).



Worm Gear Mount Removal

Replacement

4. Disconnect Motor M6 from filter and remove three screws on motor mount (see *Lateral Motor Mounting*).



Lateral Motor Mounting

5. Reassemble in reverse order.

Note: Install the motor so that the mounting flange is as close to the motor as possible. This is the case when the table is moved towards the tower. Reinstalling the motor in this position helps to get the alignment straight and avoids possible binding.

6. Check calibration and functionality.

Cassette Carriage Motor M5 Replacement

1. Remove all covers on the X-ray arm.
2. Remove the splash and crash cover underneath the table.

Replacement

3. Remove cover on bottom of the arm (next view).

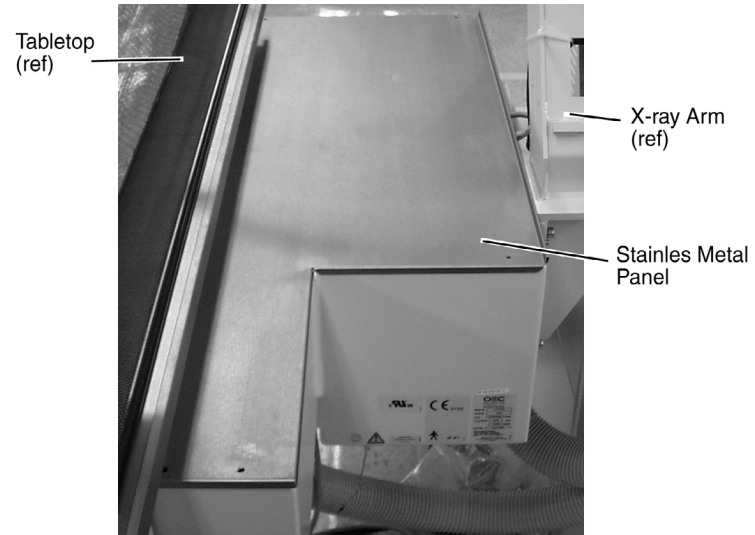


Removal of Cover on Bottom of X-ray Arm

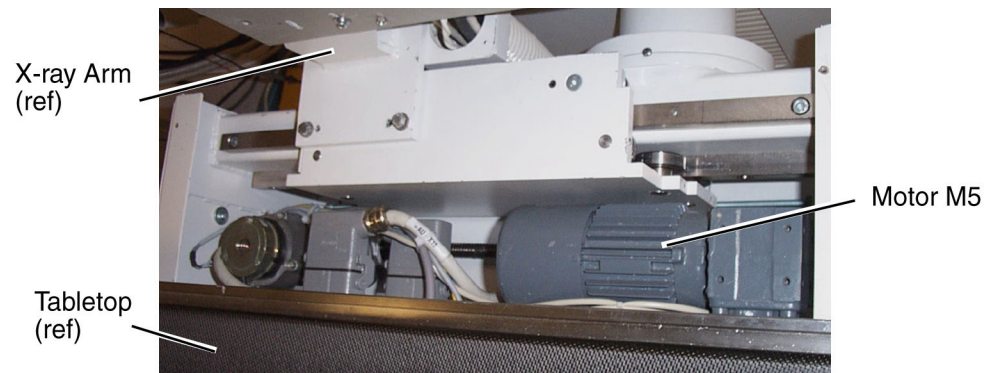
4. Move tabletop laterally away from the tower.

Replacement

5. Remove the stainless metal cover on top of the table by removing five screws (next 2 views).



Stainless Metal Cover



View with Stainless Metal Cover Removed

Replacement

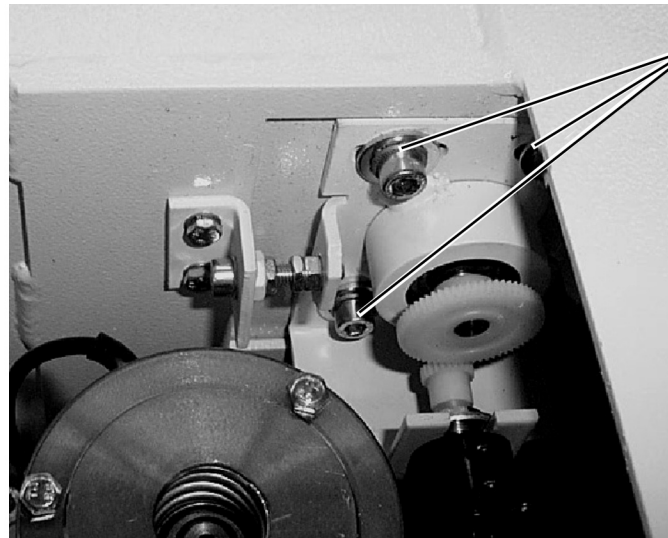
6. Remove the Plexiglas by removing the left and right covers on the inside of table to gain access to the ten mounting screws, five on each side (next view).



Removal of Plexiglass Cover

Replacement

7. Loose belt tension and remove belt from pulley (next view).



Mounting
Screws,
Belt Tension

Cassette Carriage Drive Pulley and Belt Tensioning

Replacement

8. Remove pulley from motor (next view).



Removal of Pulley

Note: To get easier access to the pulley, manually move the cassette carriage into the exposure position.

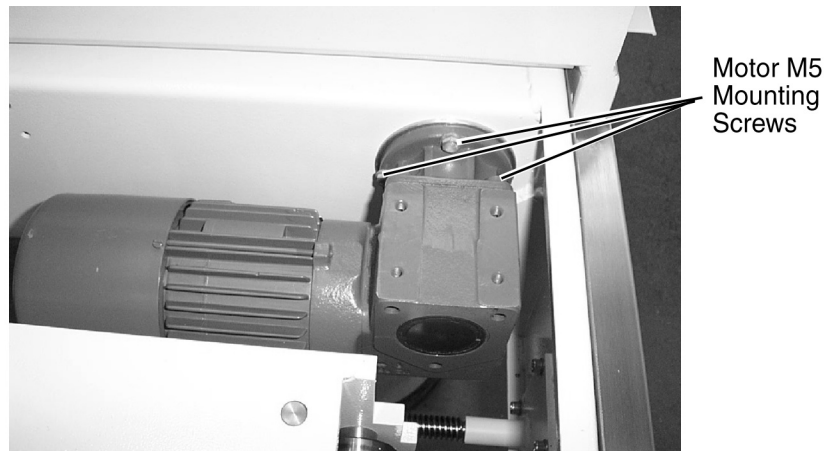
Replacement

9. Disconnect motor M5 connector X15 (next view).



Motor M5 Connector

10. Remove three mounting screws (next view).



Motor M5 Mounting Screws

Replacement

11. Replace motor and reassemble in reverse order.

Note: The belt tension should be adjusted that a force of 25 N (5.6 lbs) allows the belt to travel 10 mm (3/8") measuring with a spring balance in the center between the pulleys.

12. Run calibration including film alignment. Refer to *Calibration* in this Service Manual for details.
13. Perform functional test to ensure proper operation.



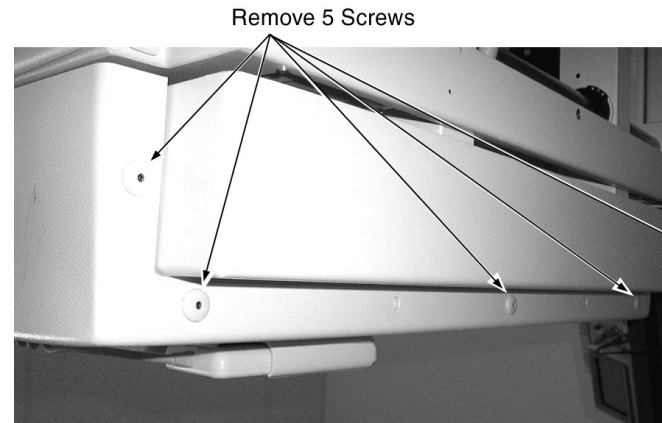
Table Belt Adjustment and Replacements

Table Longitudinal Belt Replacement

1. Remove cover on head end of table by removing five screws from bottom.



Head End Of Table

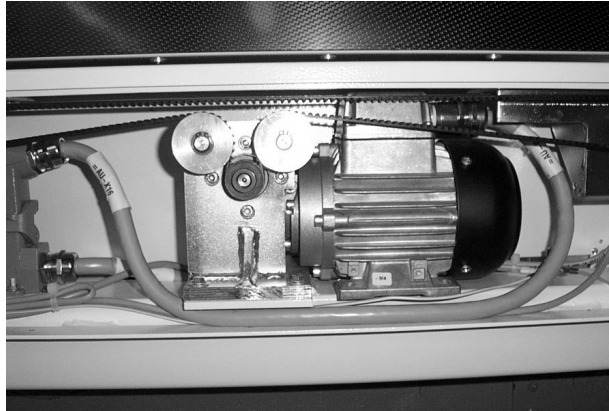


Remove Five Screws



Replacement

2. This provides access to the longitudinal drive area.



Longitudinal Drive Area

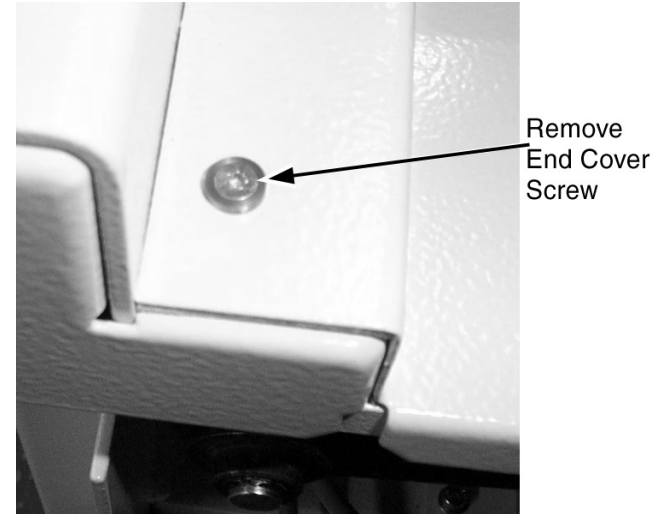
3. With the table in center position, drive table about 3" towards foot end.

Replacement

4. Remove small end covers by removing one screw on each side.



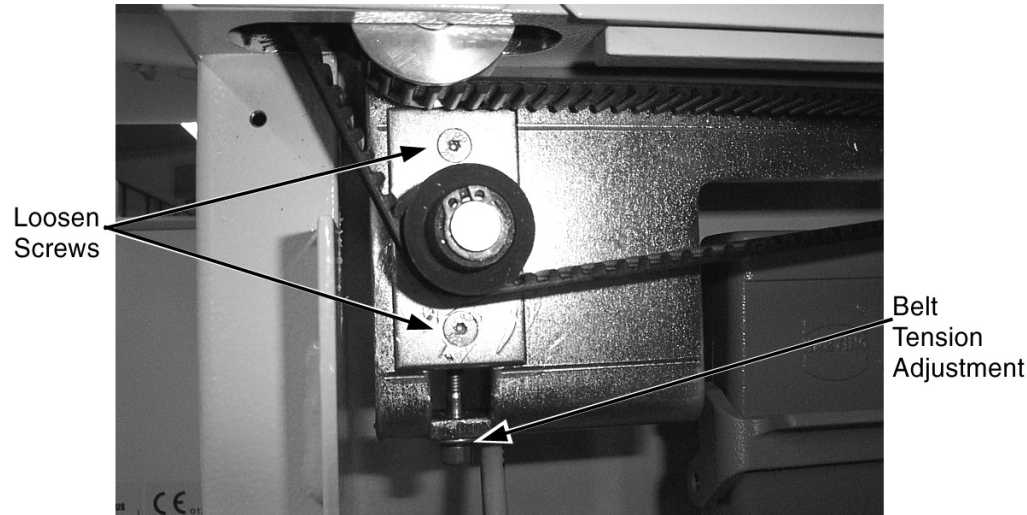
Small End Covers



End Cover Screw

Replacement

- Loosen screws above and below the black rollers on left and right side of table.



Screw Location and Belt Tension Adjustment

- Loosen the belt tension by adjusting screw on bottom on left and right side of table.
- Replace belt and reassemble in reverse order.
- Perform calibration. Refer to Calibration chapter for details

Note: The belt tension should be adjusted that a force of 35 N (8 lbs) allows the belt to travel 8 mm (5/16") measuring with a spring balance in the center between the pulleys. (See next page.)

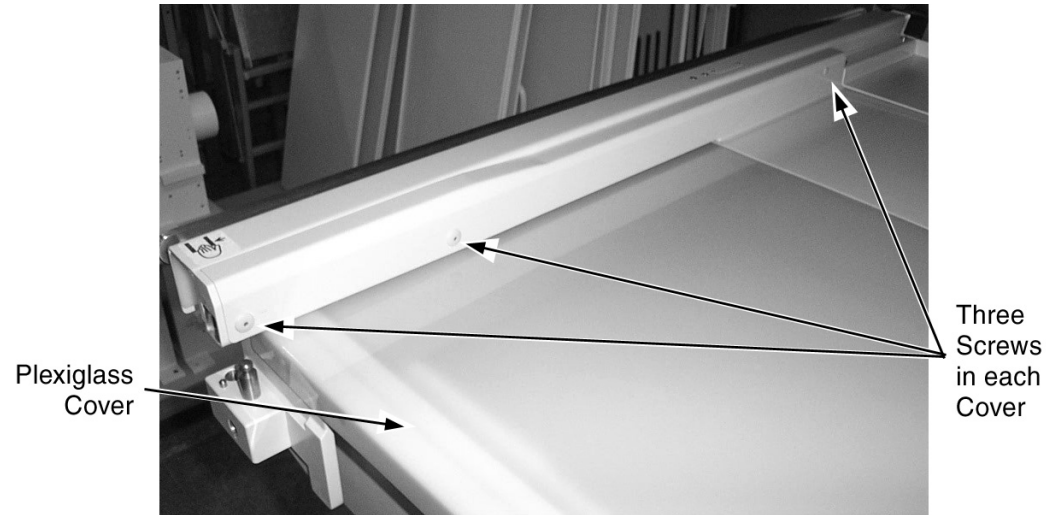
- Perform functional test to ensure proper operation.

Table Longitudinal Worm Gear Replacement

- Gain access to the worm gear by performing steps 1 through 5 of the preceeding section (*Table Longitudinal Belt Replacement*).
- Loosen the belt tension by adjusting screw on bottom on left and right side of table (see above) then remove belt.
- Lift up the table top.

Replacement

4. Remove the left and right inside covers by removing three screws. (see below).



Right-side Cover Screws

5. On the left and right side remove small oval covers in the center of table rails and the two screws next to them to remove table top (see below).

Caution: *In the next step, do not permit the coiled cable inside to be damaged.*

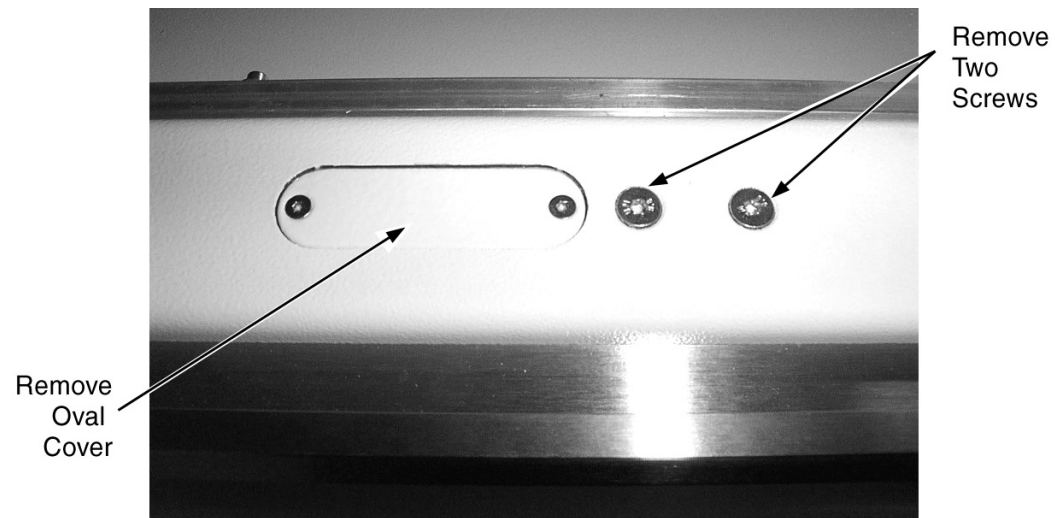
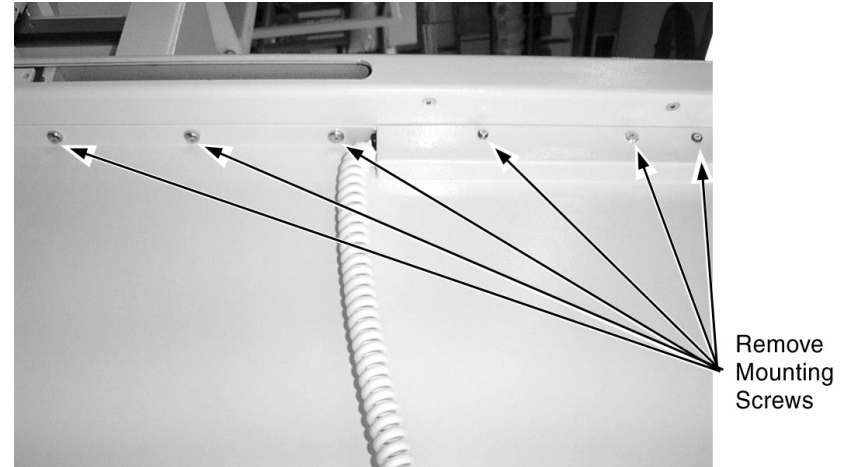
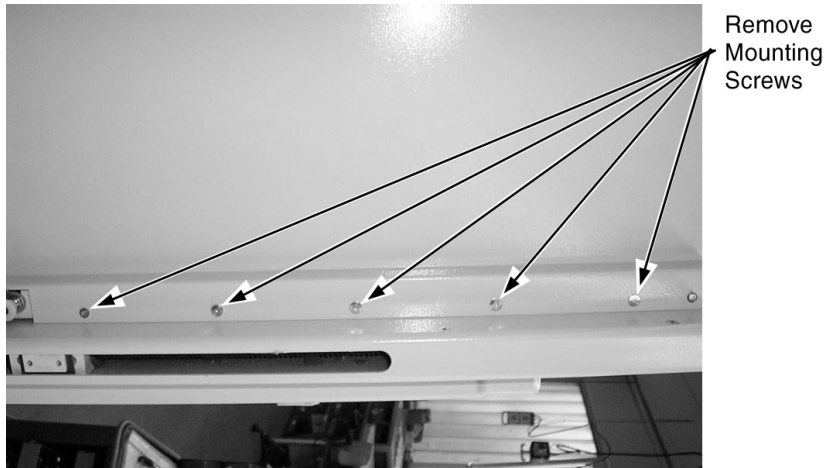


Table Rail Screws

6. Lift off the table top.

Replacement

7. Remove inside plate by removing mounting screws (see below).



Inside Plate Mounting Screws

Replacement

8. Remove mounting brackets on both sides (see below).



Mounting Brackets



Contents



Installation



Service



Schematics



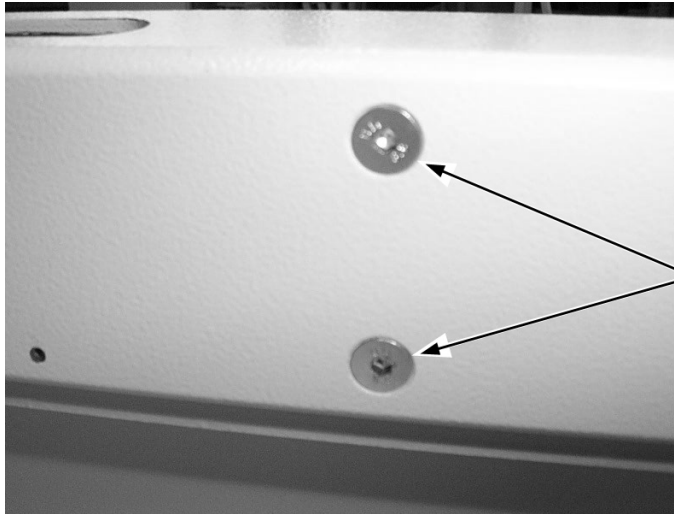
Periodic Maintenance



Illustrated Parts

Replacement

9. Remove six screws of the three worm gear mounting blocks (see below).



Remove
Screws

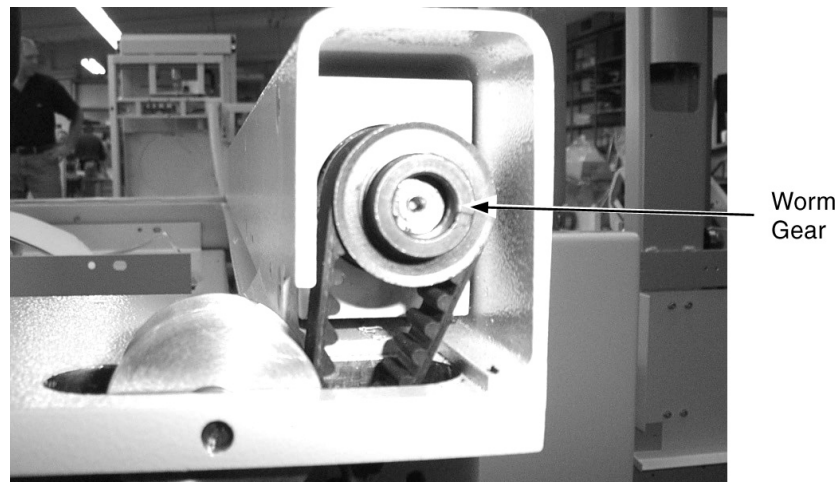


Remove
Screws

Worm Gear Mounting Block Screws

Replacement

10. Pull out worm gear (see below).



Worm Gear Removal

11. Install new worm gear and reassemble in reverse order.

Note 1 Turn mounting block into correct position on worm gear before inserting worm gear.

Note 2 Ensure that work gear is greased properly.

Note 3 To install table top adjust mounting blocks even on both sides by turning the worm gear without the belt installed.

Note 4 The belt tension should be adjusted that a force of 35 N (8 lbs) allows the belt to travel 8 mm (5/16") measuring with a spring balance in the center between the pulleys.

12. Verify calibration and perform functional test to ensure proper operation. Refer to the *Calibration* chapter in the Service Manual for details.

Table Longitudinal Belt Tension

Belt tension should be determined as follows:

The spring balance should be placed centered between the belt return wheel (Fig. T - 2) and the belt tension roller (3) to achieve a deflection of 1 cm when a force of 35 N is applied. Adjustment can be made by means of the tension screw (4) after loosening the two mounting screws (5+6).

Table Vertical-Tilt Belt Tension

Belt tension should be determined as follows:

The spring balance should be placed centered between the drive wheel (on motor side) and the belt wheel for the spindle (Fig. U - 2) to achieve a deflection of 1 cm when a force of 80 N is applied. Adjustment can be made by means of the tension screw (4) after loosening the two mounting screws (5+6).

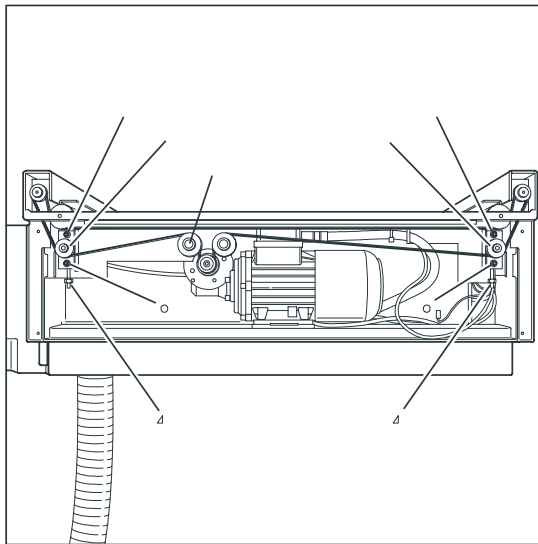


Figure T

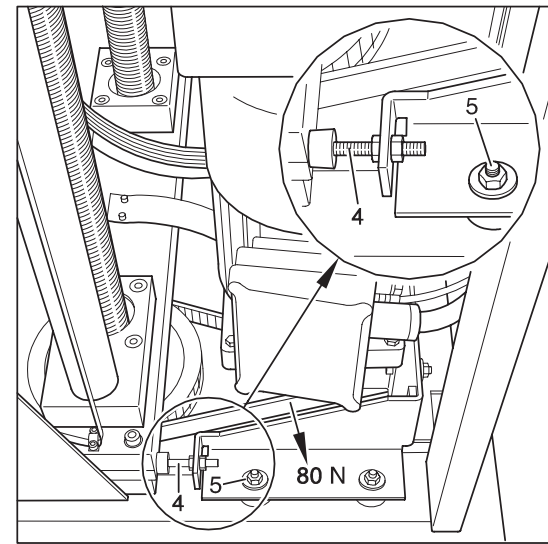


Figure U

Cassette Carriage Assembly

Drive Belt Tension

Move the tabletop to the maximum forward position and take off the cover panel (Fig. V - 1) after removing the five mounting screws.

Belt tension should be determined as follows:

The spring balance should be placed centered between the motor-side drive pulley (Fig. W - 3) and the belt return pulley (2) to achieve a deflection of 1 cm when a force of 25 N is applied. Adjustment can be made by means of the tension screw (4) after loosening the four mounting screws (5).

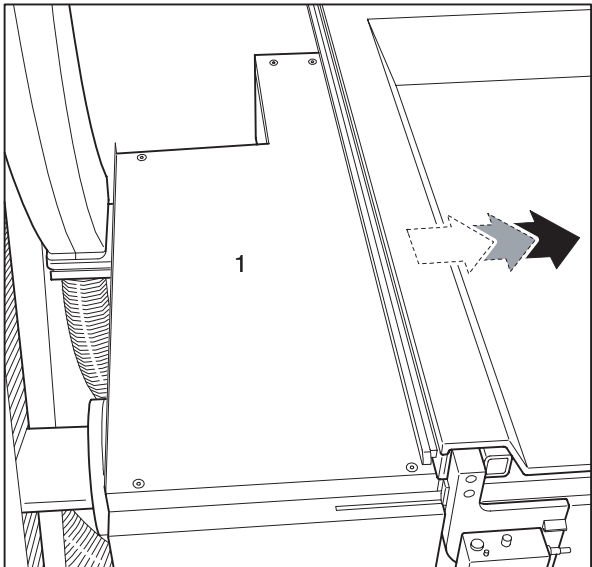


Figure V

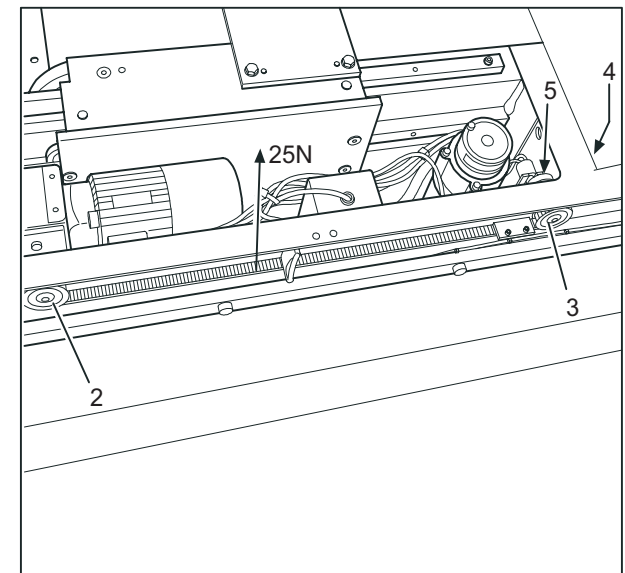


Figure W

Tray Movement Potentiometer

Move the cassette carriage into the park position and turn the potentiometer (Fig. X - 1) until it is one half turn before the mechanical end position, while doing this, take note of the direction of the turn. Adjust the potentiometer pinion (2) to the opposing pinion (3). Re-calibrate, per *Calibration* chapter.

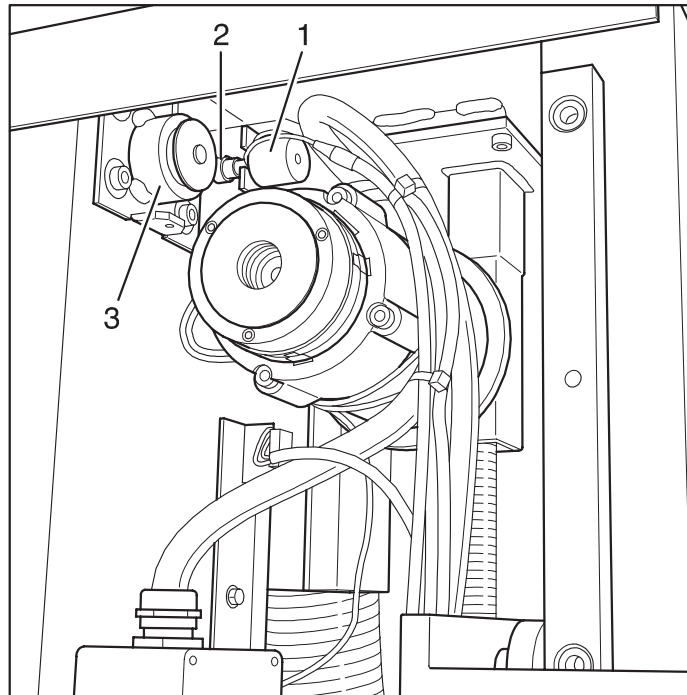


Figure X

Carriage System Potentiometer

Move the support arm until it is at the mechanical end stop at the foot end. Turn the potentiometer (Fig. Y - 2) until it is half a turn in front of the mechanical end position; while doing this, take note of the direction of the turn.

Move the system toward the head end until it is 7 mm in front of the stop and save the software limit for the head-end limit position.

Move the system toward the head end until it is 7 mm in front of the stop and save the software limit for the foot-end limit position.

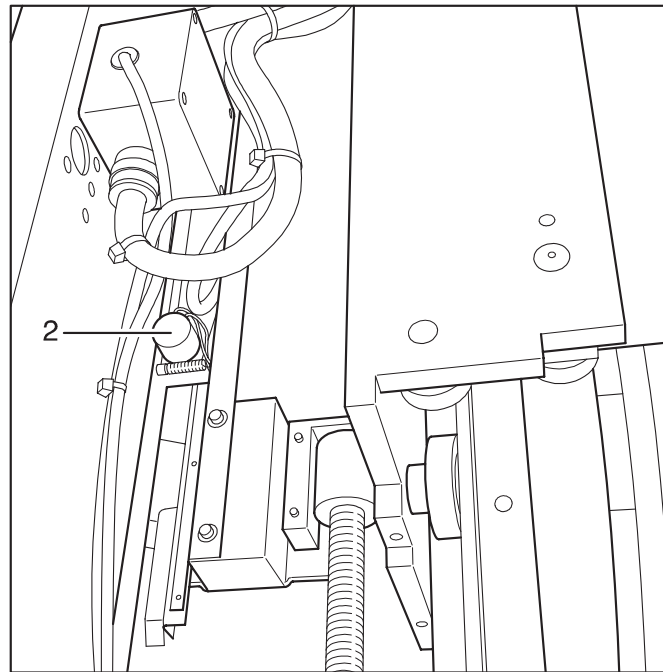


Figure Y

Cassette Carriage and Image Alignment Switch

Move the Cassette Carriage to the foot end to the mechanical stop, move the system carriage into the exposure position. Adjust the S12 switch (Fig. Z - 1) for positive operation at film center alignment.

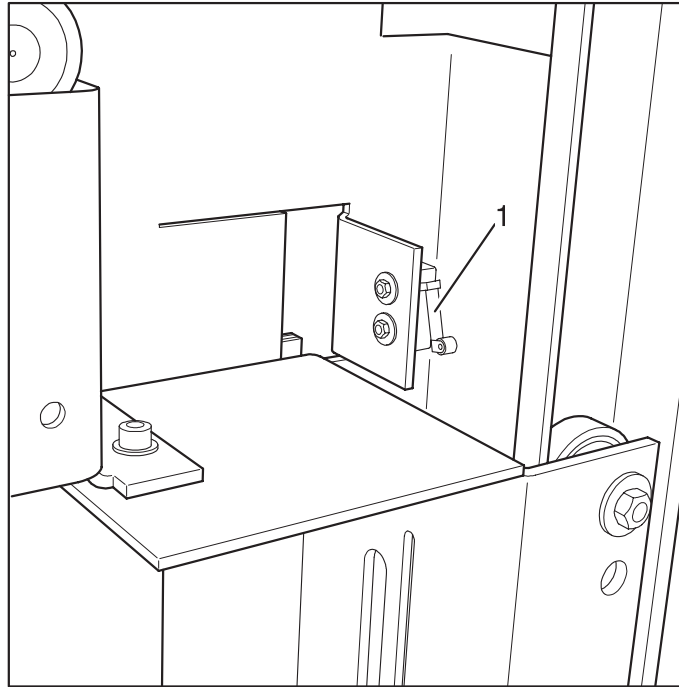


Figure Z

Movement Safety Switch

Remove the cover panel (Fig. AA - 1). Move the system carriage to the head end until there is 3 mm distance and adjust the switch strike plate (Fig. BB - 1) so that it just actuates the S6 switch. Move the system carriage to the foot end until there is 3 mm distance and adjust the switch strike plate (Fig. BB - 2) so that it just actuates the S7 switch. Calibrate the table (see *Calibration* chapter) for a software stop at least 7 mm from the strike plate.

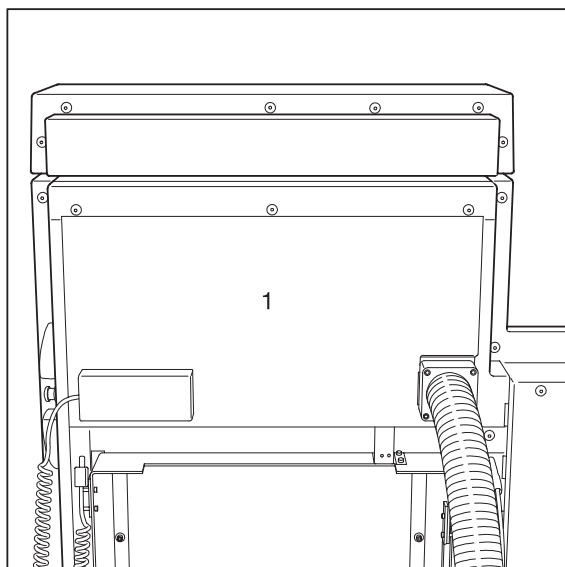


Figure AA

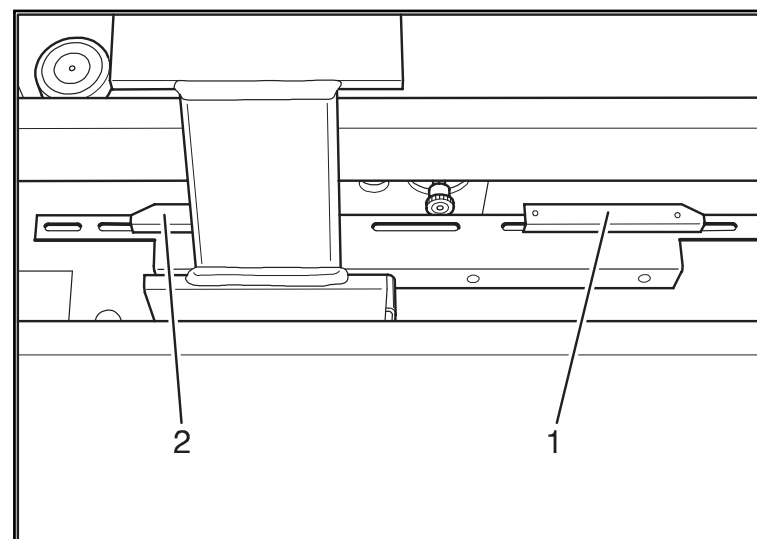


Figure BB

Sense Switch Replacement

1. Remove the Splash and Crash cover.
2. Remove cover on bottom of table at the head end. See illustration below.



Table head end cover removal

3. Remove both metal covers on top of table.
4. Remove the Plexiglas cover by removing the left and right covers on the inside of table to gain access to the ten mounting screws, five on each side. Refer to cover removal photo on next page.

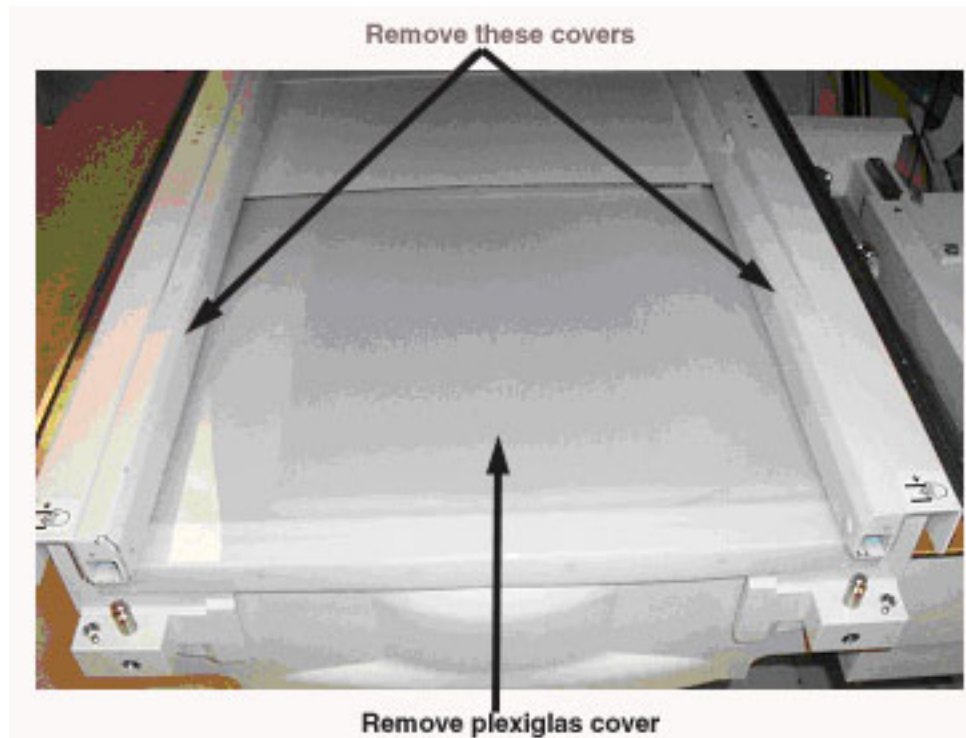
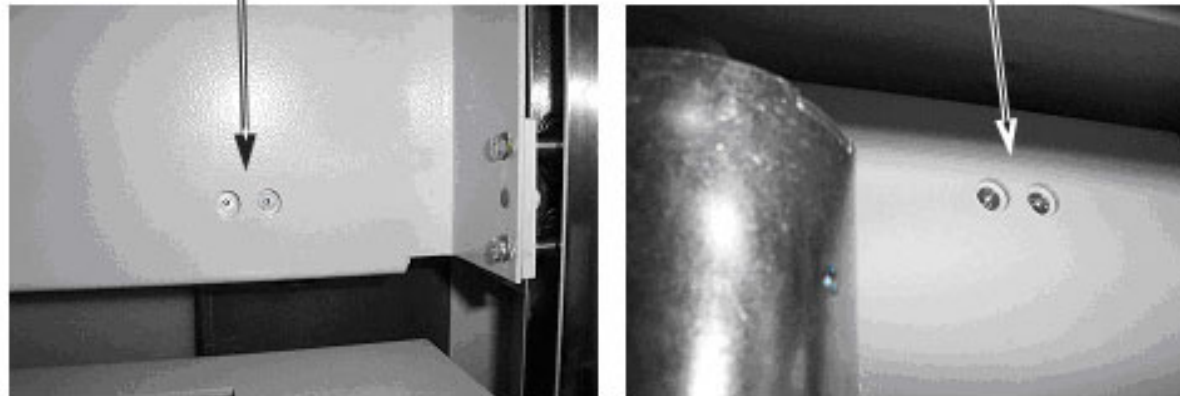


Table Cover Removal

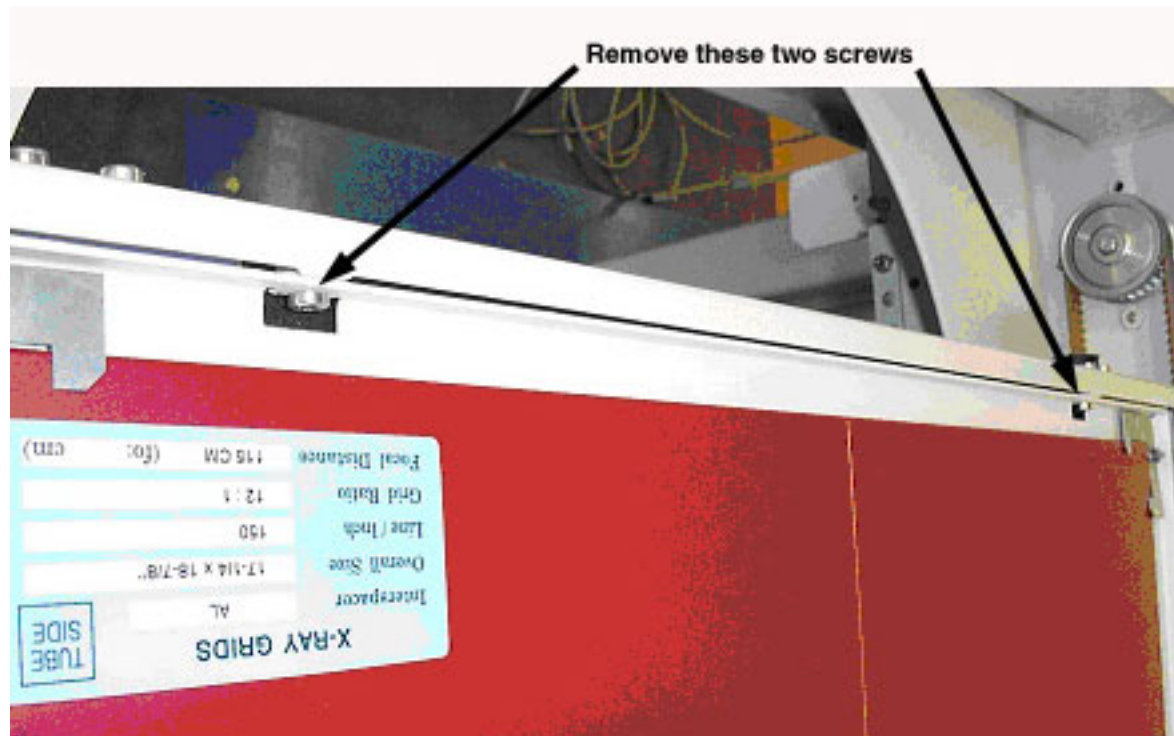
5. Remove handle from front of cassette tray (4mm hex screw and 8mm nut).
6. Remove four screws on bottom front of cassette tray from underneath the table (next view).



Cassette front screws on underside of table

Replacement

7. Move cassette carriage to exposure position by selecting film mode on the control console.
8. Remove the AEC chamber by removing the two screws mounting the frame. See AEC Chamber screw removal photo below.



AEC Chamber Screw Removal

Replacement

8. Remove the cassette carriage by removing the screws and bumpers on each corner. See *Corner Screw and Bumper Removal* photo below.

NOTE: Each bumper must go back to its original location.



Corner Screw and Bumper Removal

Note: Using hand control buttons 1 and 3, move cassette carriage between load and exposure position to gain access to all four screws and bumpers.

Caution: For safety, open the cassette carriage door when not moving the cassette carriage. Close it when moving. Stay in Service Mode all the time, or the film tray will return to the load position.

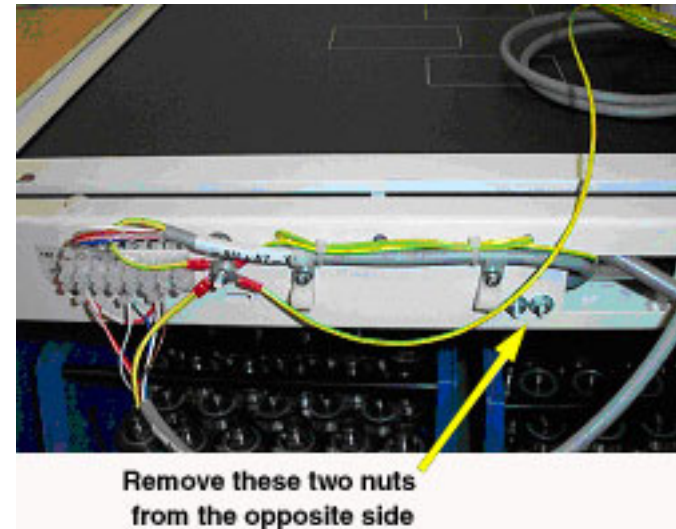
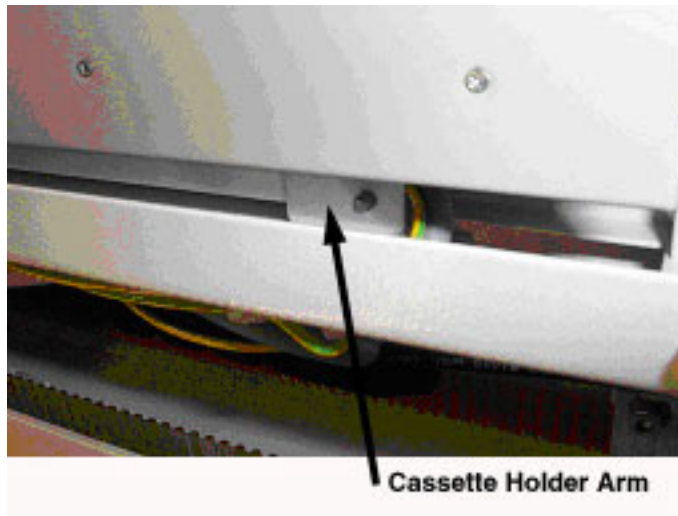
Replacement

9. Loosen the black cable support caterpillar by removing the two 7mm hex screws to allow more room to access the terminal block on the rear of the **cassette carriage** housing. See *Cable Support Caterpillar Removal* photo below.



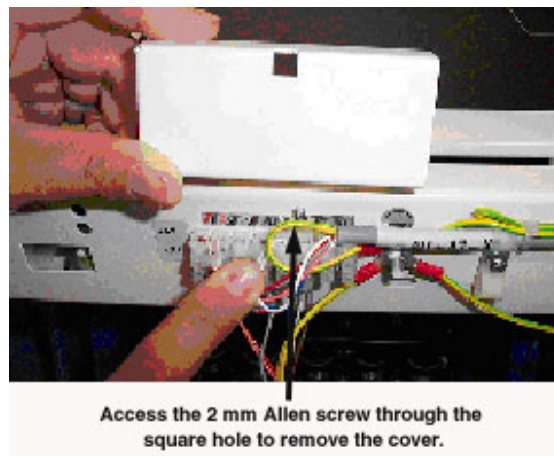
Cable Support Caterpillar Removal

WARNING: Ensure that power is turned off before you continue!



Cassette Holder Arm Removal

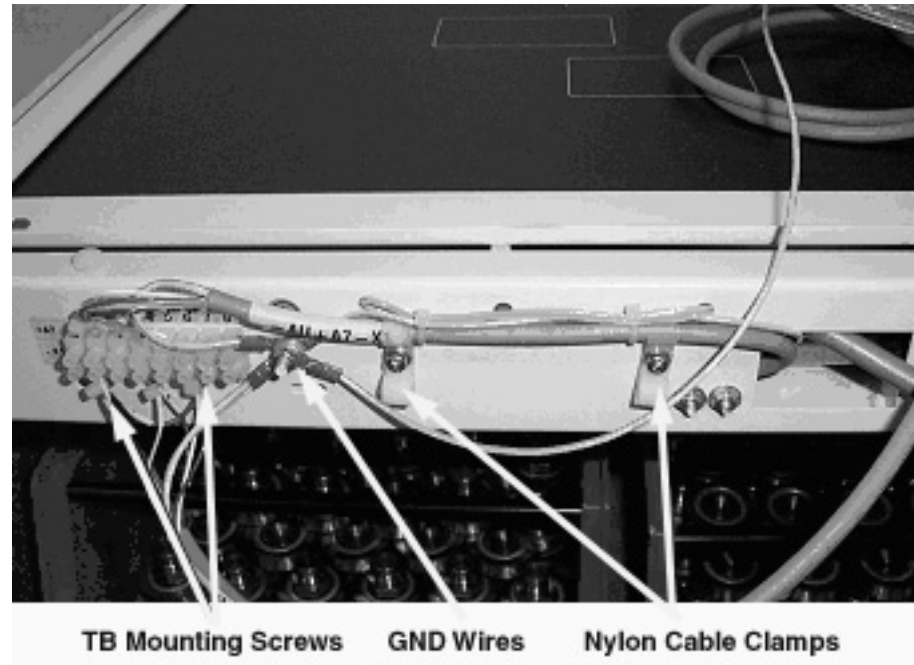
11. Remove the small cover on the rear of the **cassette carriage** to access the Terminal Block underneath it. See *Terminal Block Cover Removal* below.



Terminal Block Cover Removal

Replacement

12. Remove the GND wires (7 mm nut), and the two nylon cable holders (3 mm Allen screws). Refer to *Terminal Block and Wire Removal* photo below.

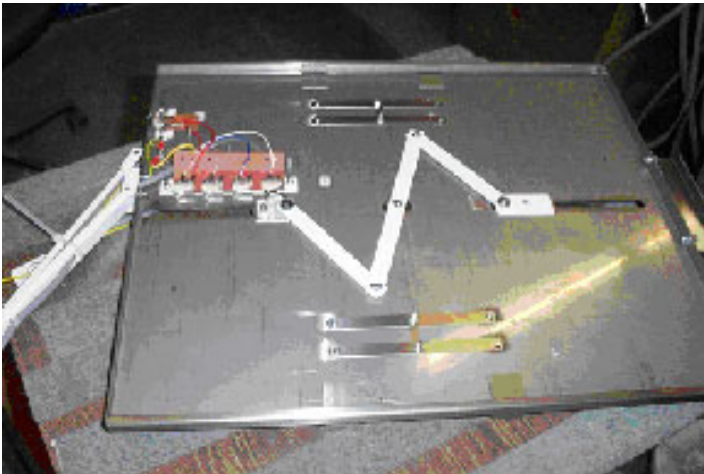


Terminal Block and Wire Removal

13. Remove terminal block mounting screws. Slide terminal block towards opening in housing.

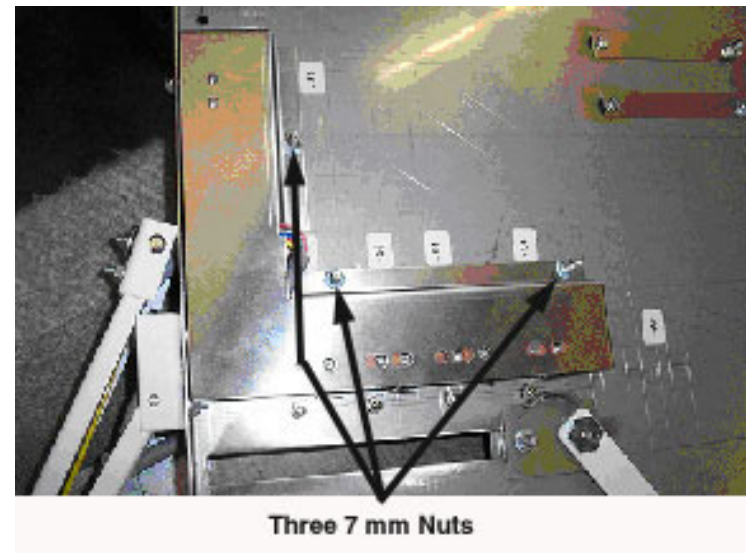
Replacement

14. Remove the cassette tray from its housing by sliding it through the door. See *Cassette Tray and Terminal Block* photo.



Cassette Tray and Terminal Block

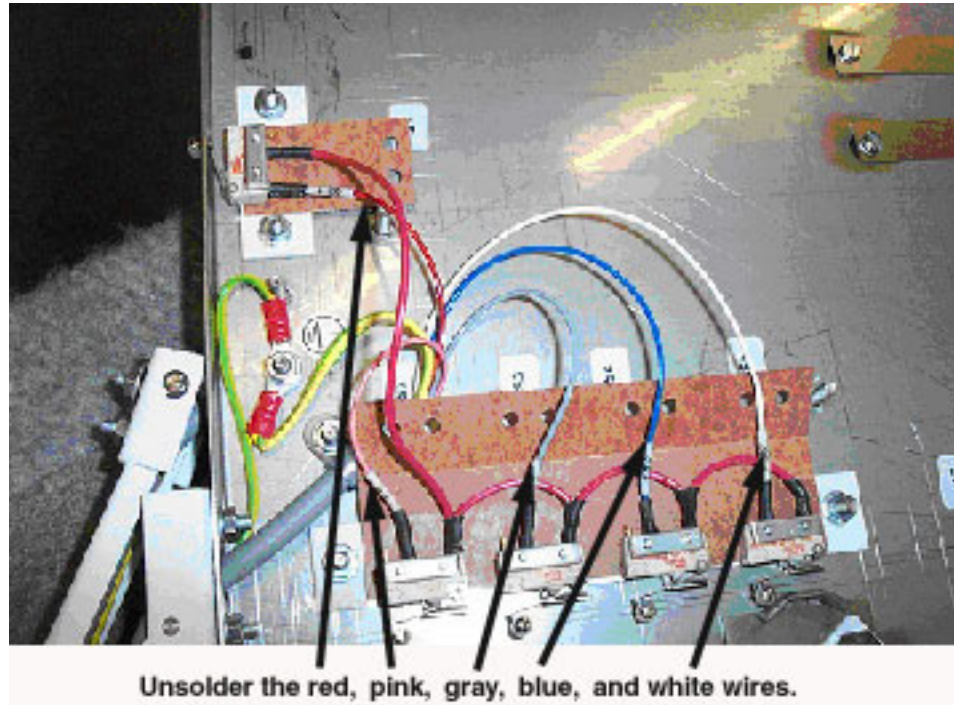
10. Remove the switch assembly cover by removing the **three 7 mm nuts**. See photo.



Three 7 mm nuts

Replacement

11. Remove switch assembly by unsoldering the **red, pink, gray, blue, and white** cables as shown.



12. Reassemble the system in reverse order.

Note: Test the functionality of all switches before reassembling.

Bearing Replacement

Note: Refer to the Replacement section in the Service Manual for details about cover removal.

1. Remove the Splash and crash cover and the head end cover from underneath the table (Figure 1).

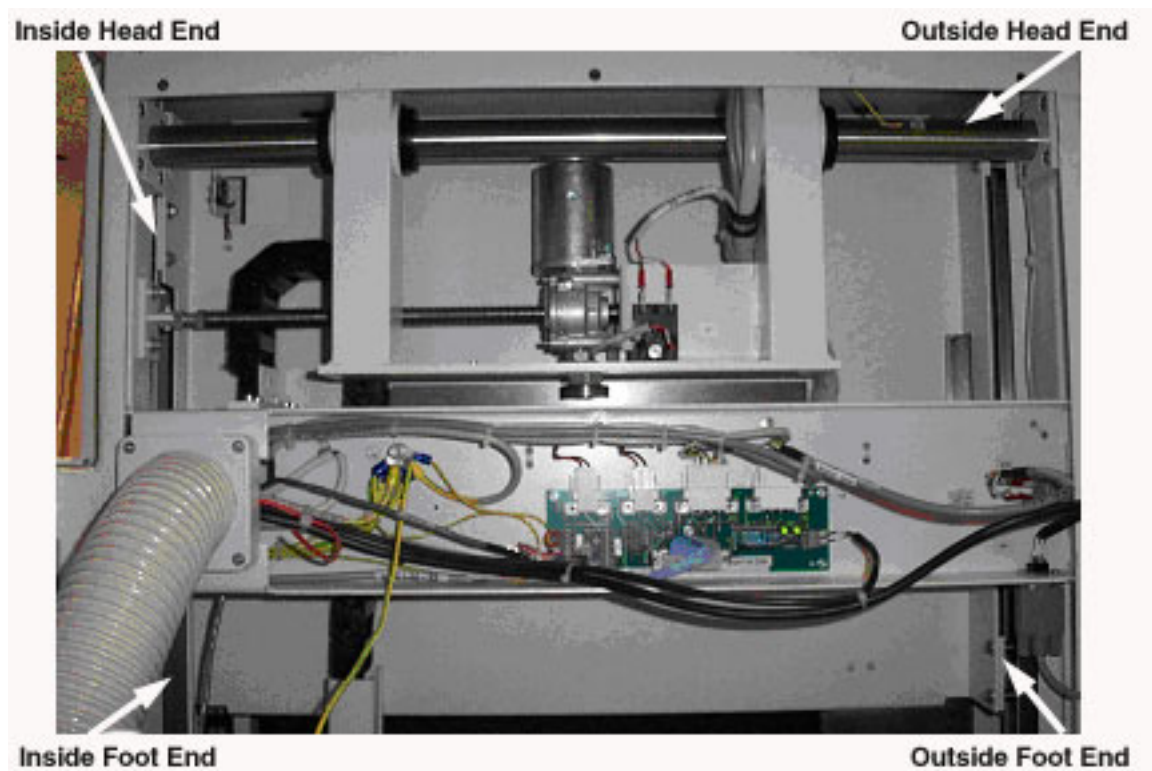


Splash and Crash Removal

2. Locate the bearings to replace. Refer to the next photo.

Note: The head end bearings can be accessed easier by moving the cassette carriage towards the exposure position.

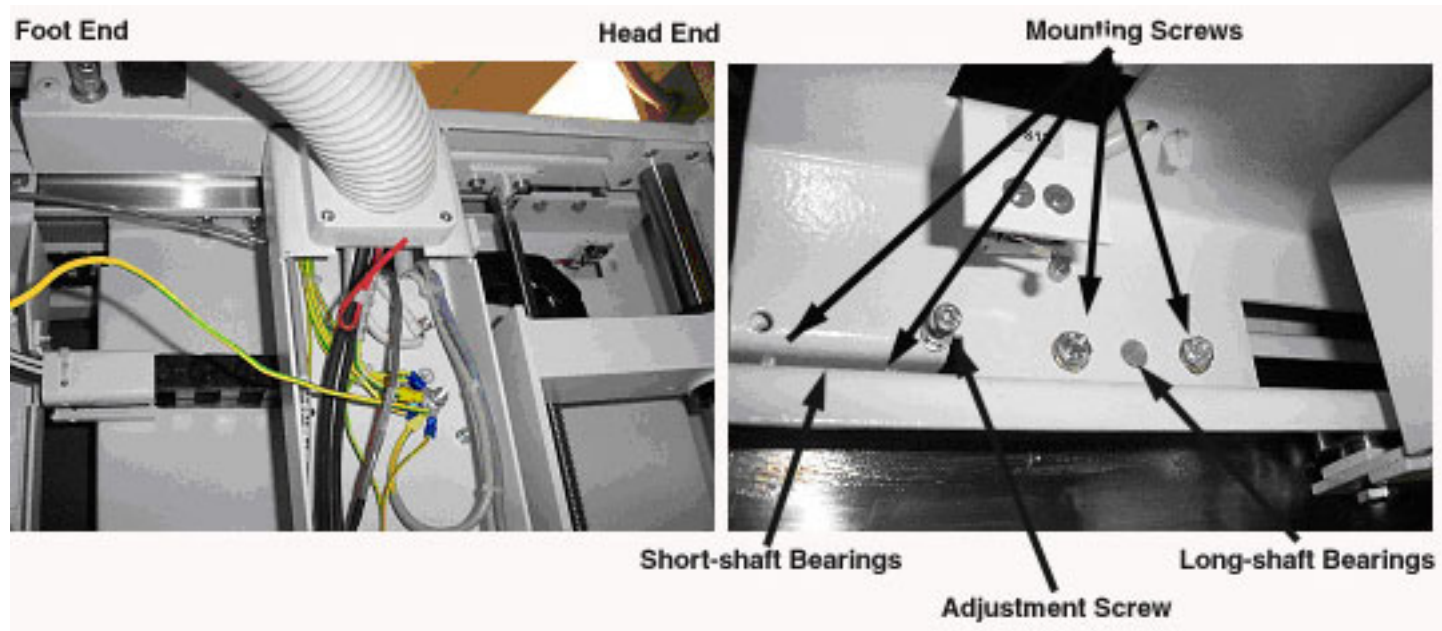
Replacement



Under side of Table

Replacement

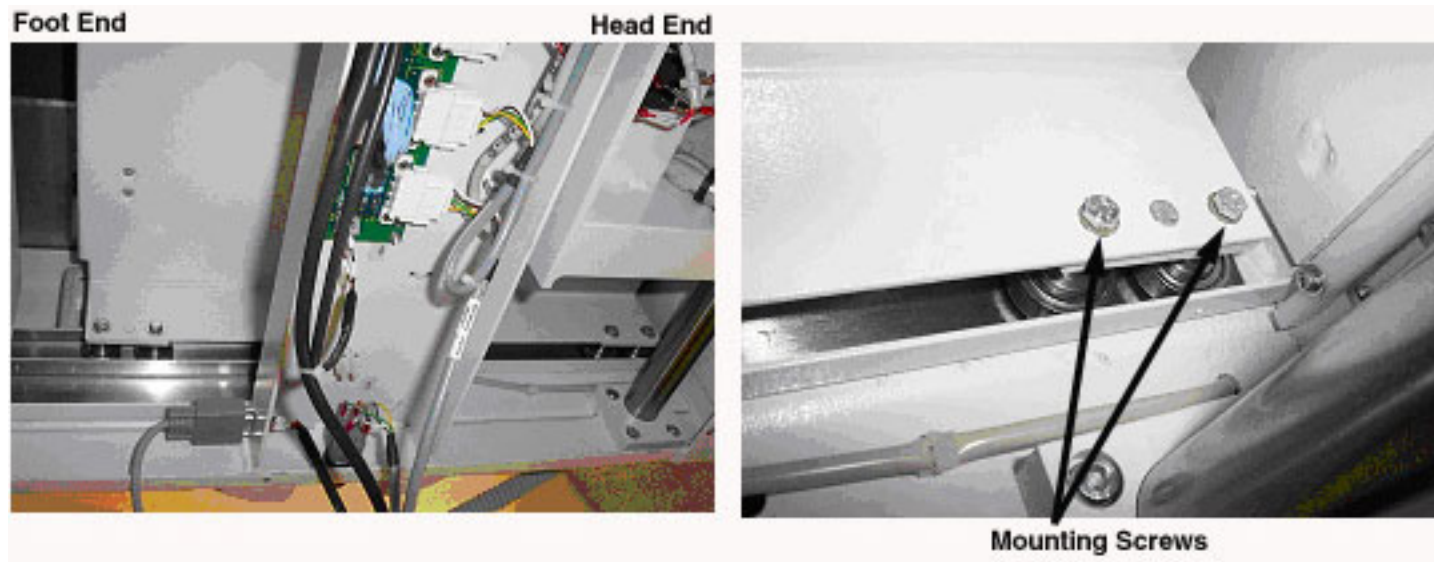
3. On the inside, the side closest to the tower, there are two sets of bearings, short-shaft bearings that are mounted parallel to the table and long-shaft bearings that are mounted perpendicular to the table. See next two photos.



Bearing Mounting Positions

Replacement

4. On the outside, the side away from the tower, there are only two long-shaft bearings that are mounted perpendicular to the table as shown below.



Long-shaft bearing Mounting

Image Chain Component Replacement

II Carriage Replacement

The II Carriage is suspended from the table on six sets of roller bearings to allow the image chain to be positioned independently of the table. The II Adapter Plate is attached to the II Carriage with two metal strips, eight washers and eight bolts (see Figures CC and DD).

1. With the table positioned vertically, remove the II and camera as a unit by removing the eight bolts, washers and metal strips (Fig. CC-1). (Refer also to the GE *OEC Uroview® 2800 Installation Manual*.)

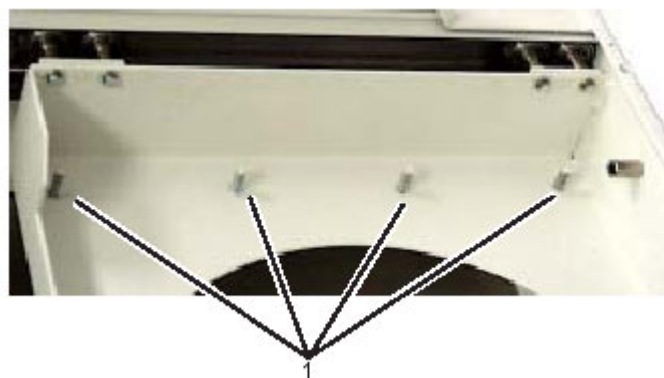


Figure CC

Note: The Image Chain (II and CCD camera) are heavy. Use accepted Field Service methods for proper handling of this assembly for removal from the table.

2. Remove the II Positioning bracket (Fig. DD – 1, 2) attached to the worm drive shaft assembly of the II Positioning Motor (2) and the II Carriage (1). Note the positions of the four bolts holding the II Positioning bracket to the II Carriage.

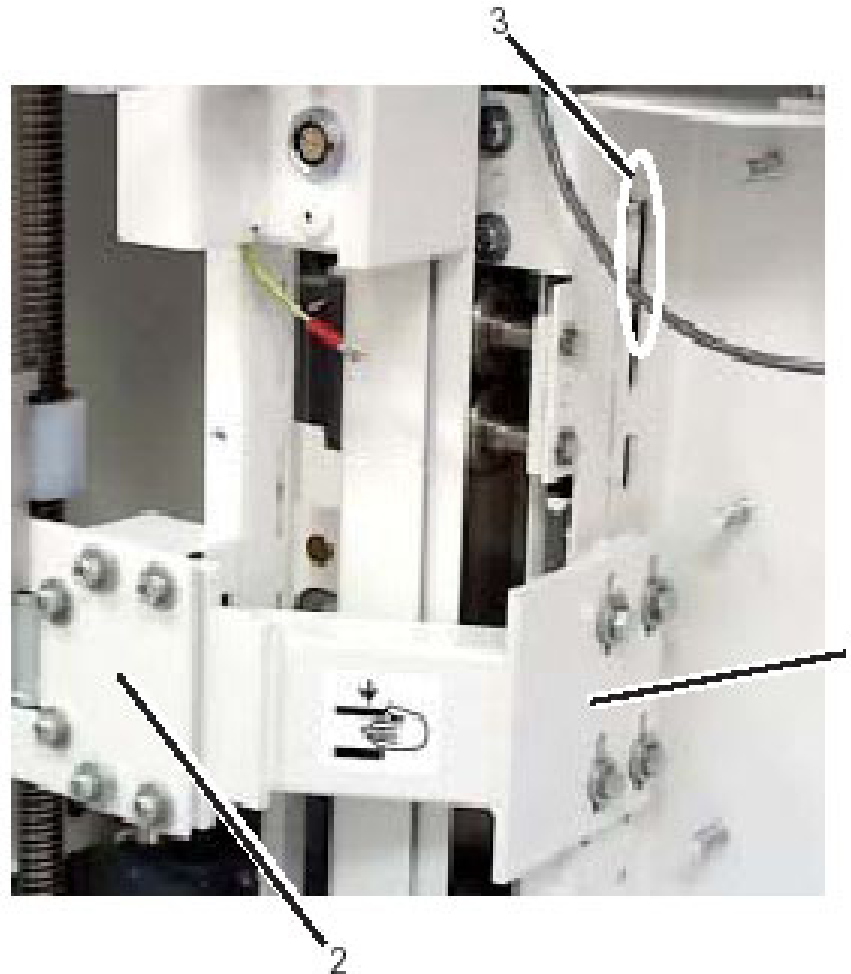


Figure DD

3. Remove the II Carriage by removing the two bolts attaching each set of roller bearings, noting carefully the mounting positions of the two sizes of bearings on the Carriage.
4. Remove the II Stop Block from the II Carriage after carefully noting the position of the mounting screws (Fig. DD – 3).

Replacement

5. Mount short-shaft roller bearings on the new II Carriage before inserting the Carriage into the table and the bearings into the corresponding bearing track (Fig. EE). The short-shaft bearings go into the roller bearing track closest to the tower and on the II Carriage mount position that is parallel to the bottom of the table (1).

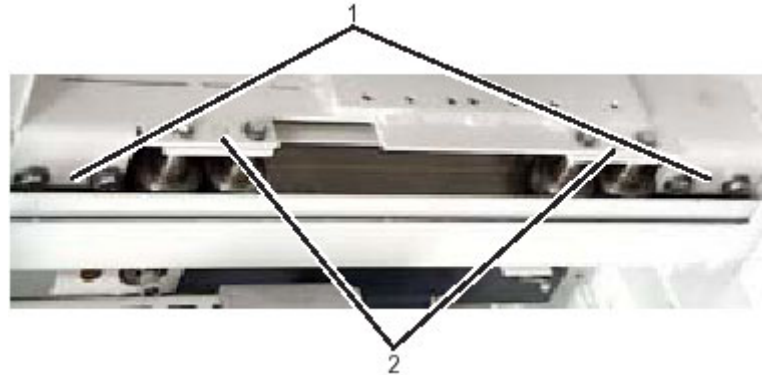


Figure EE

6. The long-shaft bearings should be mounted after the Carriage is mounted on the table. These bearings are mounted on the II Carriage in a position perpendicular to the table (Fig. EE – 2, Fig. FF – 1, 3).

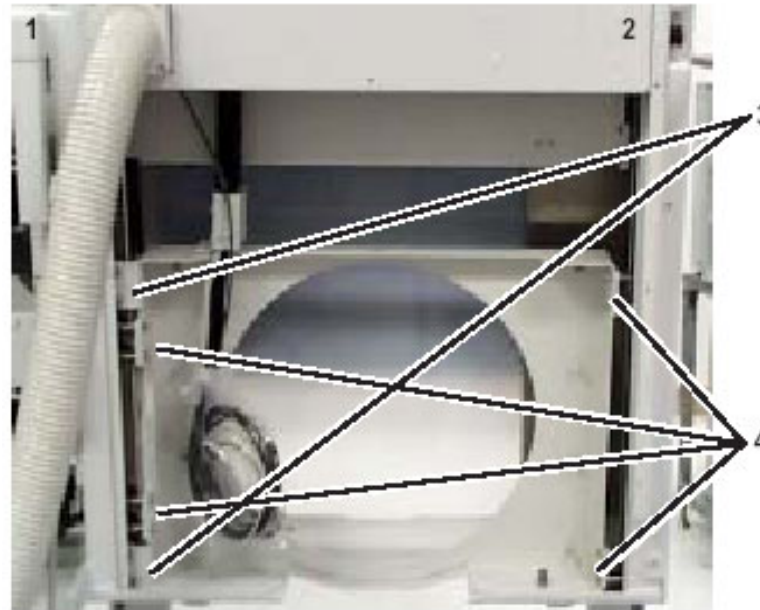


Figure FF

7. Mount the II Stop Block on the new II Carriage with the mounting screws in the same position as they were on the II Carriage just removed (Fig. DD – 3).
8. Replace the II Positioning bracket (Fig. DD) by attaching it to the worm drive shaft assembly of the II Positioning Motor and the II Carriage with four bolts on each end. Use the same mounting holes on the inside of the II Carriage as were used for the former II Carriage.

Replacement

9. Position the metal strips on the studs (Fig. GG) of the II Carriage and remount the Image Chain as described in the *OEC UroView® 2800 Installation Manual*.

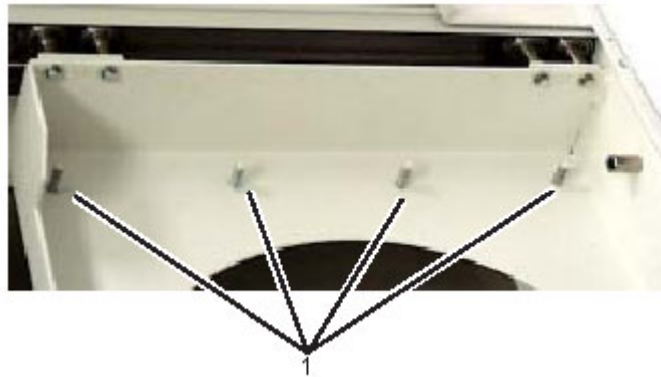


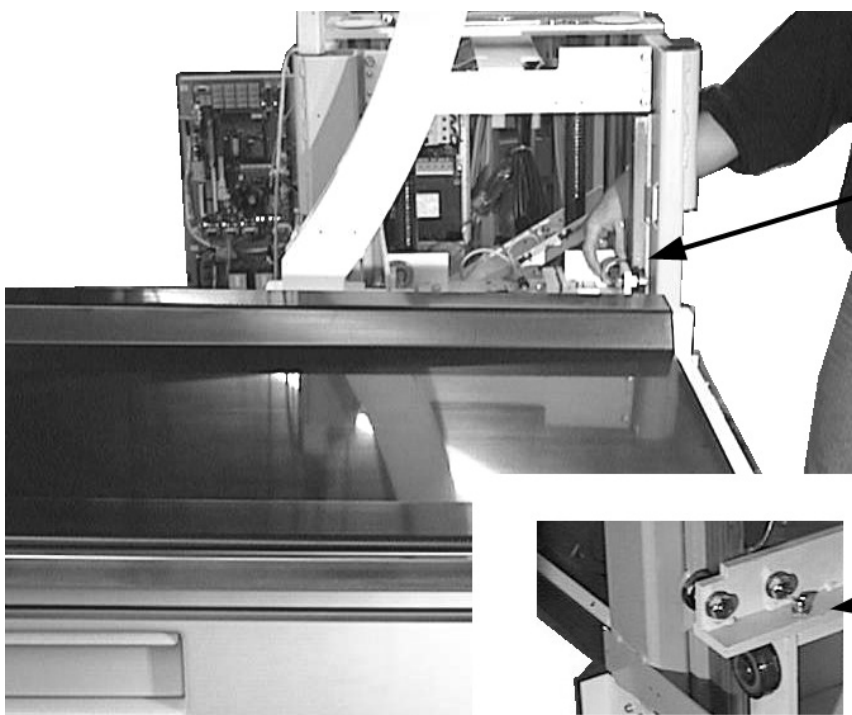
Figure GG

New Carriage Configuration

Adjustment Instruction for Additional Bearings

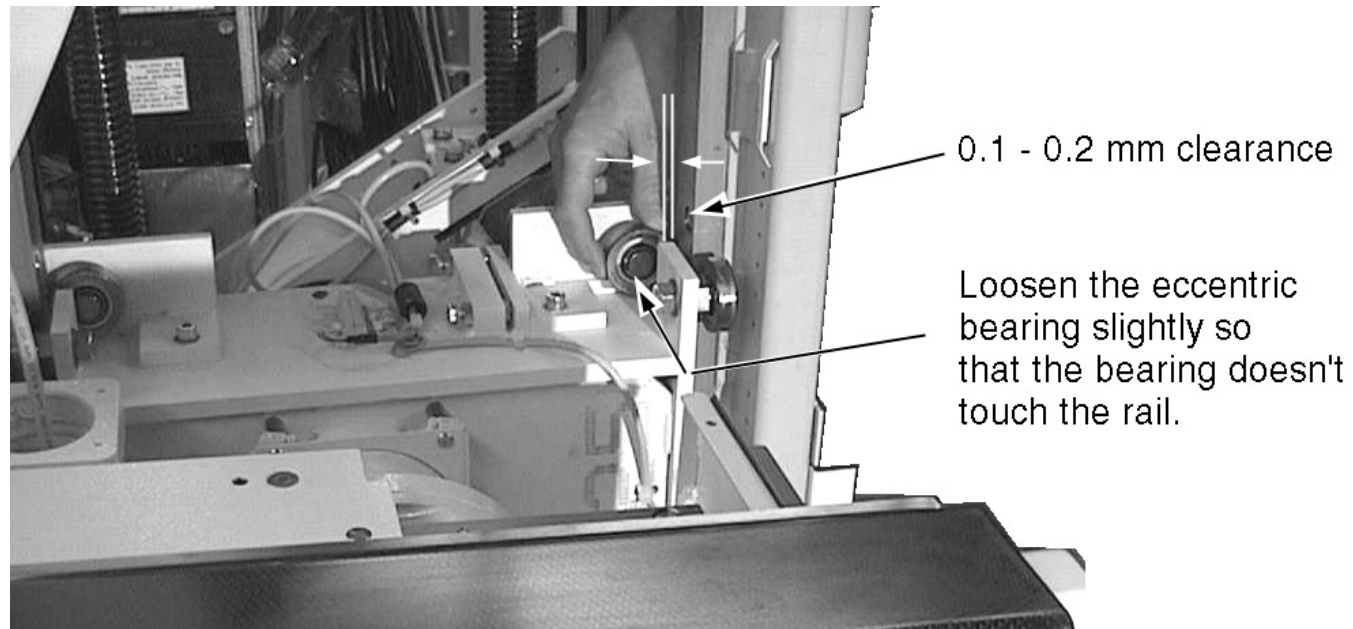
Note: The left table version is described in this section.

1. Put the table in horizontal position.



Left Version: adjustable bearings are interior on right side of vertical carriage.

Right Version: adjustable bearings are exterior on right side of vertical carriage.



Replacement

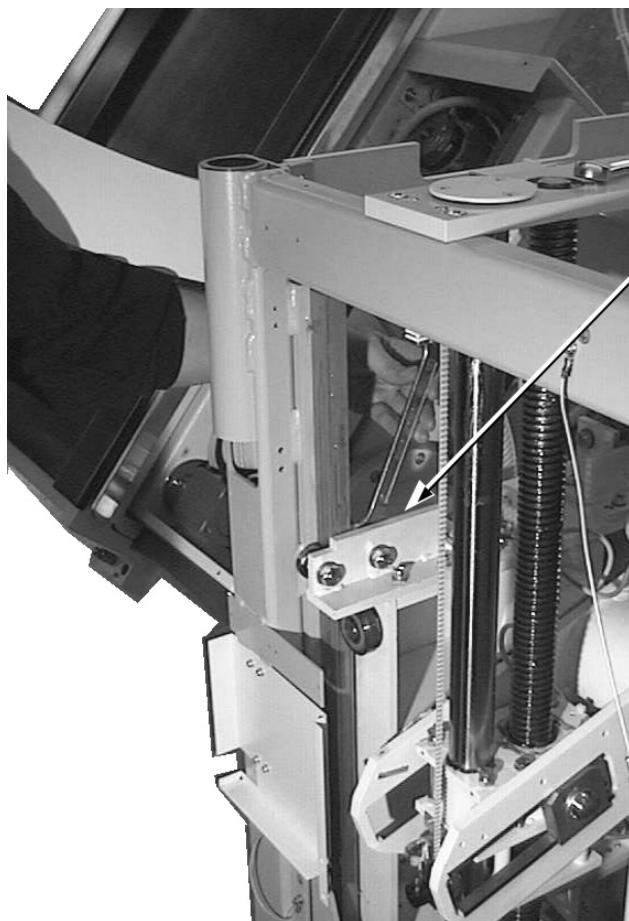
2. Incline the table.



3. The necessary position is between 60° and 70°. At about this position, weight loading changes from the exterior to the interior bearing.



4. In this configuration, the exterior bearing is free (doesn't touch the rail) and the interior bearing is solidly on the rail.

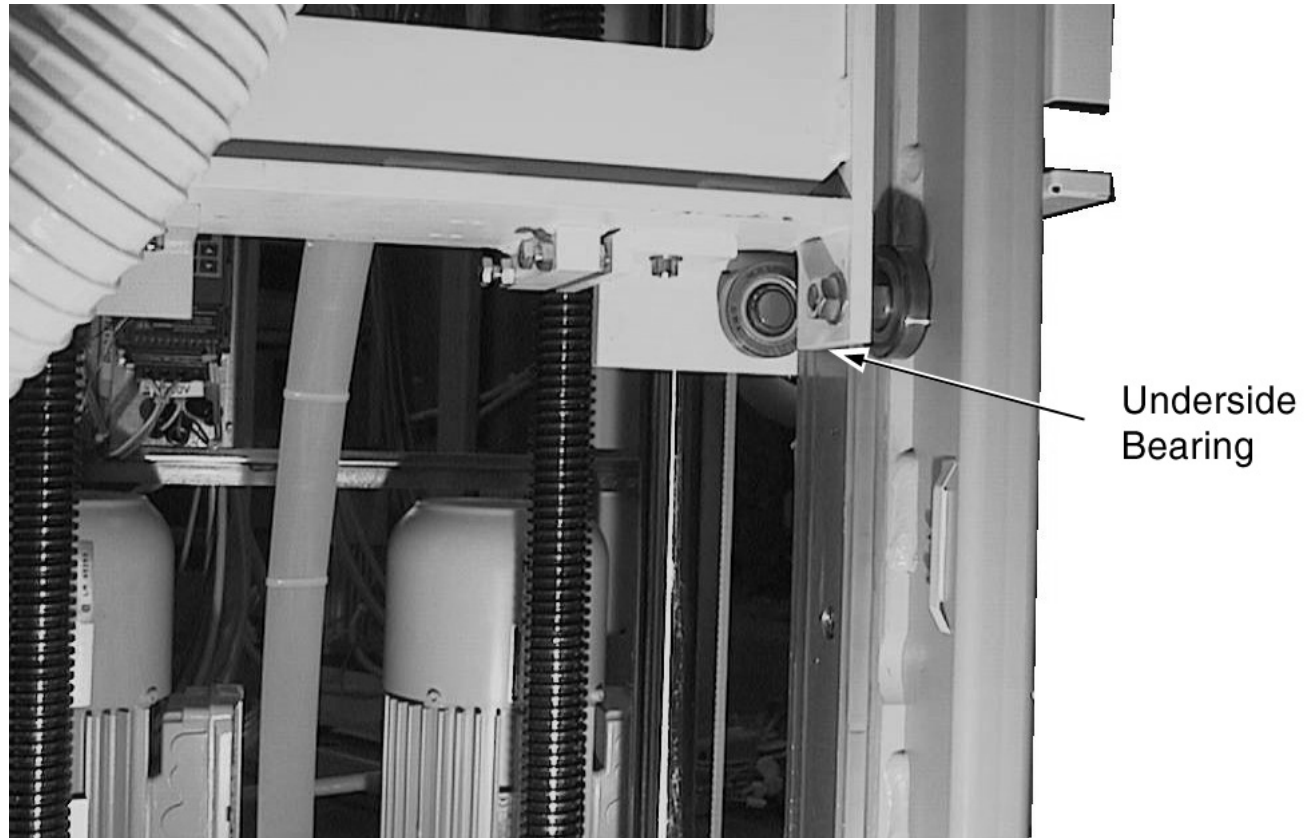


Adjust the inner eccentric bearing to remove the space between the bearing and rail...

... as long as you can still easily move the exterior bearing.



5. Use the same procedure to adjust the underside bearings.



This completes the bearing adjustment. The bearing adjustment for the right-hand table is performed in a similar manner.

Image Intensifier Installation

1. Remove the Image Intensifier adapter plate (Fig. HH - 1) from the II carriage (2).
2. Secure the II adapter plate (Fig. HH - 1) in position on the II Carriage (2) with the screws.
3. Install the II unit on the II carriage (Fig. JJ - 2) using the two strips (4+5) the eight washers and eight nuts (7).
4. Maximum torque: No more than 5 ft-lb.

Note: Do not torque the nuts more than 5 ft-lb or the bolts may strip or pull out of the II Carriage.

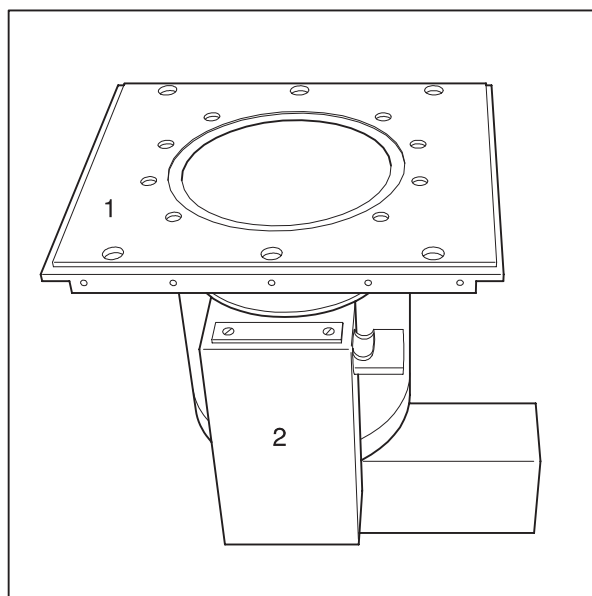


Figure HH

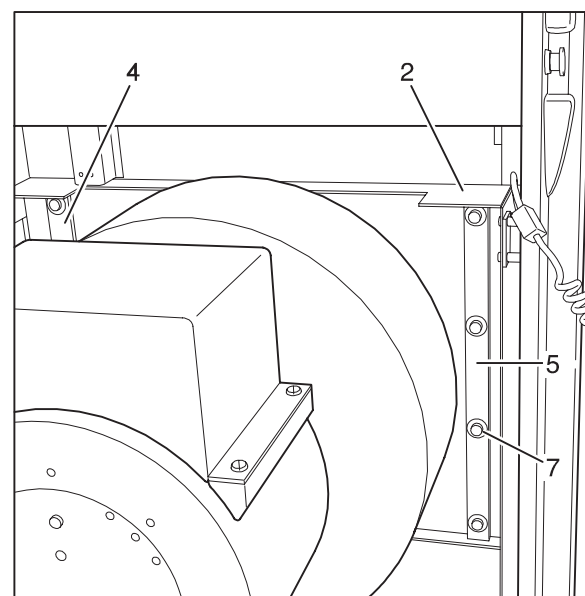


Figure JJ

Note: For removal and replacement of the Image Intensifier, be sure to use only approved Field Service methods for handling the II assembly as it is extremely heavy.

Film Cassette Grid Replacement

(See next view) Lift up the tabletop (it will be held by the gas spring). Move the tabletop laterally towards the tower and remove the front stainless panel. Move the tabletop laterally away from the tower and remove the rear stainless panel. Remove the left and right side panels. Remove the screws for the spiral cable guide panel and remove the cable guide panel. Move the tabletop longitudinally, and remove the 6 mounting screws in the polycarbonate panel. Remove the polycarbonate panel towards the front.

Switch the unit to the service mode, the green LED on the controller will go on and stay on.

Enter Service Mode, and calibrate the cassette (see *Calibration* chapter, in this manual).

The cassette carriage can now be moved slowly forward and backward using hand control position recall buttons 1 and 3.

Move the cassette carriage into the exposure position using recall button 1. Remove the mounting brackets (Fig. LL - 2). Remove the film cassette grid. To install, insert the grid with the focus mark facing up and secure it in place with the mounting brackets. Reinstall the polycarbonate panel, and replace the side covers.



Gaining Access to the Film Cassette Grid

AEC Chamber Replacement

Gain access to the film cassette grid, as explained in the previous section.

Switch the unit into the service mode. The green LED on the controller goes on and stays on. Enter Service Mode. The cassette carriage can be moved slowly forward and backward using hand control buttons 1 and 2.

Move the cassette carriage into the exposure position using recall button 1. Remove the film cassette grid frame (Fig. LL - 1) after removing the two screws (3). Remove chamber.

Install the chamber into the holder (take note of the chamber orientation) and secure it in place. Then, reinstall the grid frame and the polycarbonate panel.

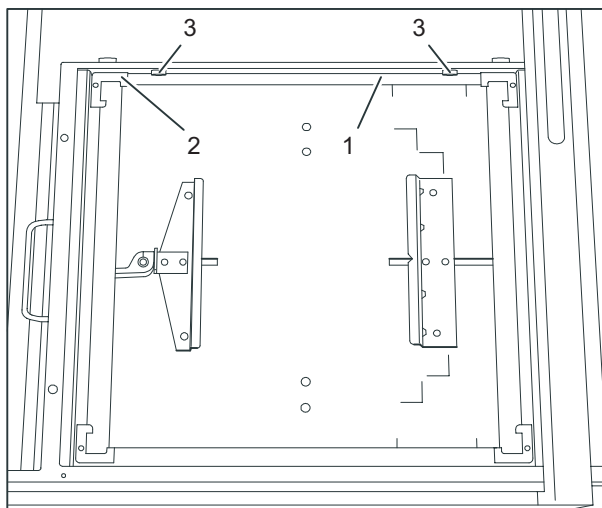


Figure LL

CCD Camera Replacement

Remove the Splash and Crash Cover using the steps described elsewhere in this section.

Unplug the two cables connected to the CCD Camera and prepare to lift the camera cover off of the unit by removing the metal strap securing the cover.

Carefully unplug the cables from the camera chassis and set the camera cover aside.

Remove the four screws (Fig. NN – 1) securing the camera cooler, but do not try to remove the camera cooler at this time.

Remove the camera mounting screws (2) and remove the camera and camera cooler from the Image Intensifier.

To replace the camera, reverse the steps above.

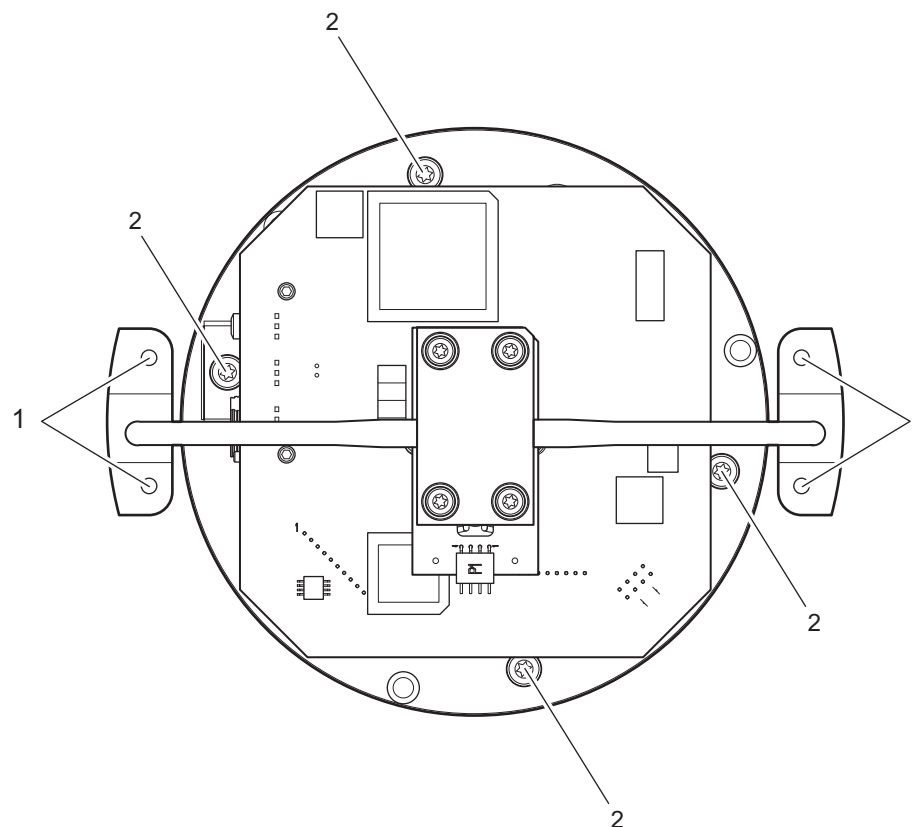


Figure NN

Generator Components Replacement

The section provides the procedures for the replacement of the generator spare parts Field Replaceable Units (FRU) in the field when it is installed in the OEC UroView® 2800.

The generator consists of five component modules:

- The AC/DC Module
- Rotation Module
- LVPS-400 Power Supply
- HV Power Module
- HV Tank

Each module can be disassembled from the system. Refer to the Generator Module Locator Diagram in this section for module locations.

PCB Replacement

All printed circuit boards are connected to each other by connectors and are replaceable. After they have been replaced correctly, they should perform a self-test after power is switched on and log themselves into the CPU.

The CPU PCB and Breaker PCB are accessible after opening the URO cover panel. They are seated on several round snap-on mounts, each of which must be compressed and pressed through.

The footswitch board is accessible only after opening the metal housing.

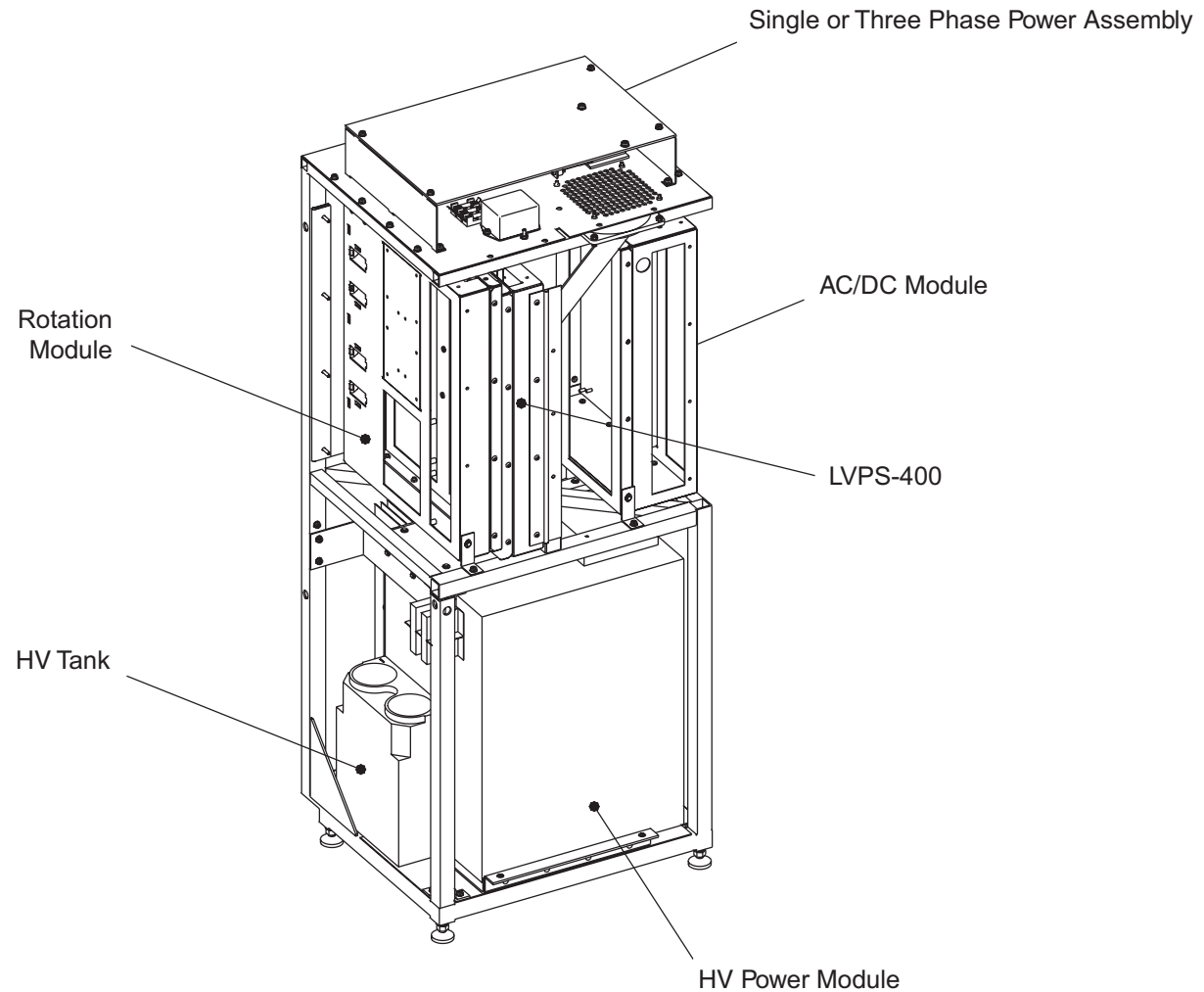
The control unit with spiral must be completely replaced.

The display with connection cable must be completely replaced.

Do not disconnect plug-in connections with the power on!

Generator Module Removal

DANGER: Make sure all AC power breakers are off and tagged out before accessing the generator modules. Lethal voltages exist in these modules when power is on.



**Generator Module Locator
Diagram**

Power Input Assembly Access

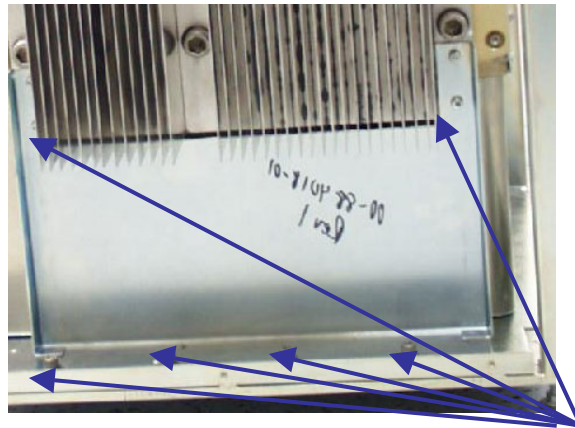
DANGER: *Make sure all AC power breakers are off and tagged out before accessing AC power wiring. Lethal voltages exist in this section when power is on.*

After removing the generator top cover, remove the four screws securing the metal cover over the Power Assembly wiring and circuit breakers. Refer to the *Illustrated Parts Manual* for assembly details.

Power Module Removal

1. Remove the generator covers as described earlier in this section.
2. Disconnect the cables plugged into the sockets on the left side of the unit (AEC, Generator communication, door light, etc.).
3. Remove the large four hex allen screws from the lower (heatsink) side of the Power Module and the four smaller hex allen screws on each side of the heatsink.

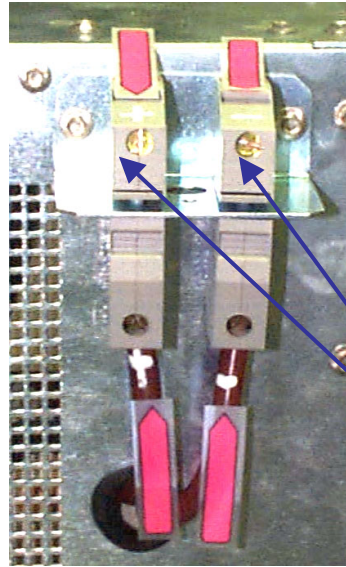
Replacement



8 Screws

Replacement

4. Disconnect the 600 VDC + and – cables from the connectors at the top of the terminal block. The terminal block is located on the tank side of the generator as shown in the photo.



Disconnect here

5. Slide the Power Module out of the frame.

Note: The module is extremely heavy. Be sure to get help in lifting and removing it from the generator frame.

6. When replacing the AC/DC PCB, be sure to replace and securely tighten the ground stud connector. The stand-off bolt should be tightened securely before allowing system operation.

AEC PCB, kV Control PCB, or Generic I/F PCB Replacement

DANGER: *Before any manual intervention, ensure the main power must be off. Apply the lock out-tag out procedure for your own safety when working inside the equipment is required.*

To protect the circuit boards, do not forget to wear the anti-static bracelet.

WARNING: *The power module weighs 60 kilograms (132.3 POUNDS). **TWO PEOPLE ARE REQUIRED TO CARRY IT.***

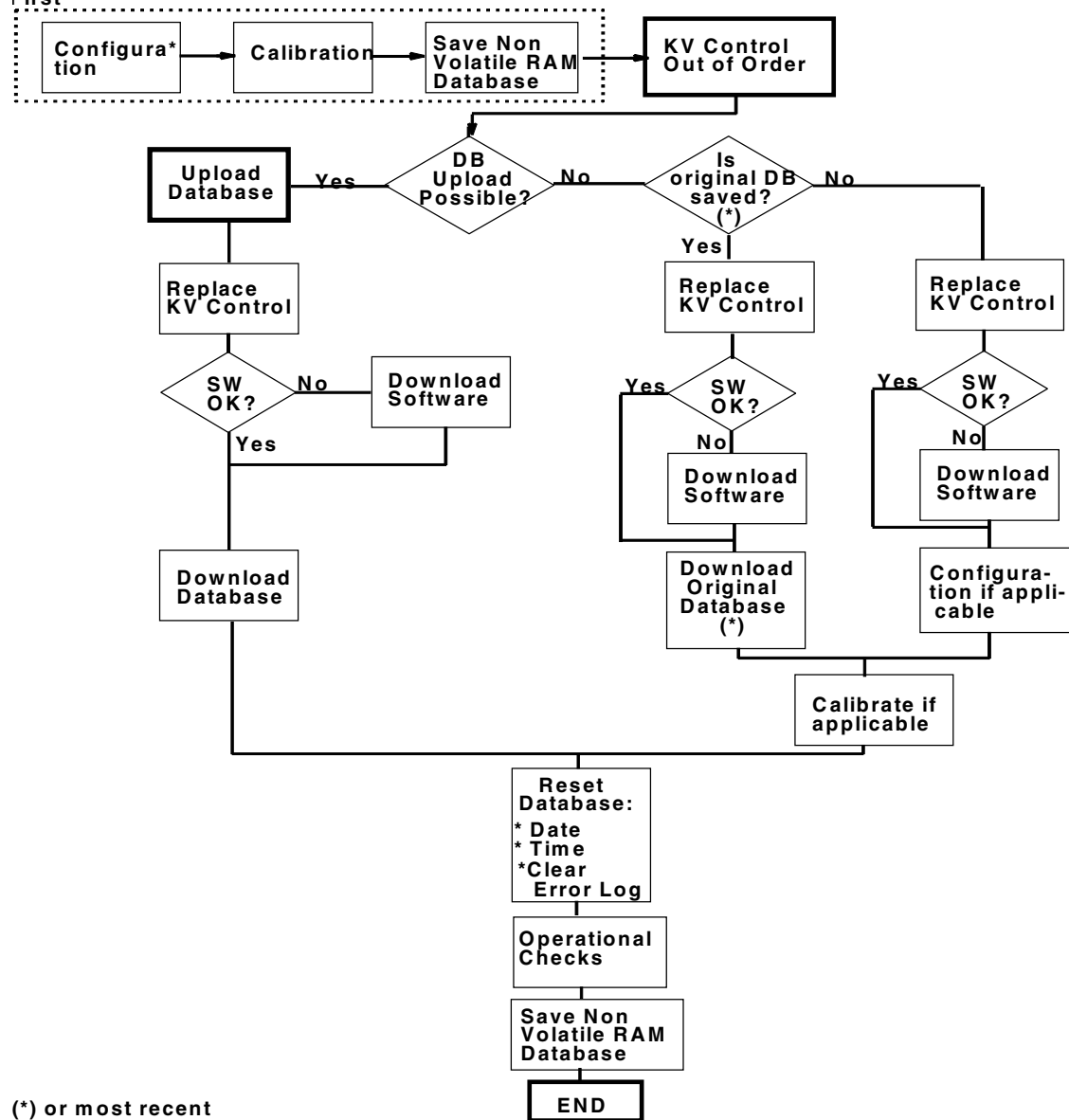
The kV Control PCB contains a saved memory database with essentially the following parameters:

- Tube configuration parameters, AEC calibration parameters, and room configuration (workstation, AEC, screen film pairs).
- Filament aging variable
- Event Logs
- Recorded parameter data

If it is possible, backup the database first. Consult the diagram on the following page if this is not possible.

Replacement

First



Disassembly

Note: *The kV Control PCB spare is pre-loaded with NP/NP+ software. It will be necessary to download the database software that is on site before replacing the PCB. A DATABASE RESTORATION IS MANDATORY.*

Use the RUS/RUT software to download and restore the database for the kV Control PCB. Refer to the RUS/RUT Help file for the procedure to use in the download and restoration of the database with a laptop computer.

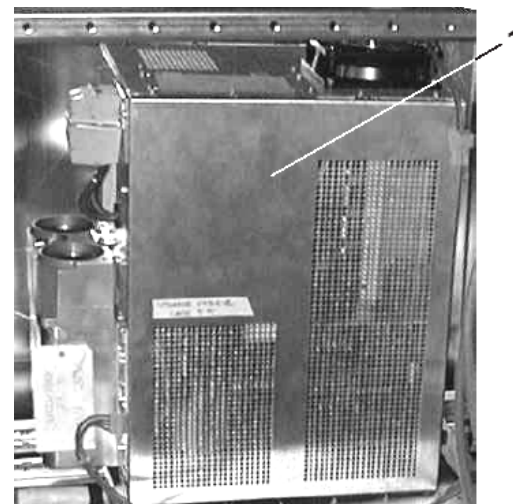
The kV Control PCB is located inside of the HV Power Module cover.

Refer to the Generator Module Locator Diagram.

Note: *Removal and installation of the KV Control PCB can be done without removing the Power Module and HV Tank from the cabinet.*

Power Unit Cover Removal

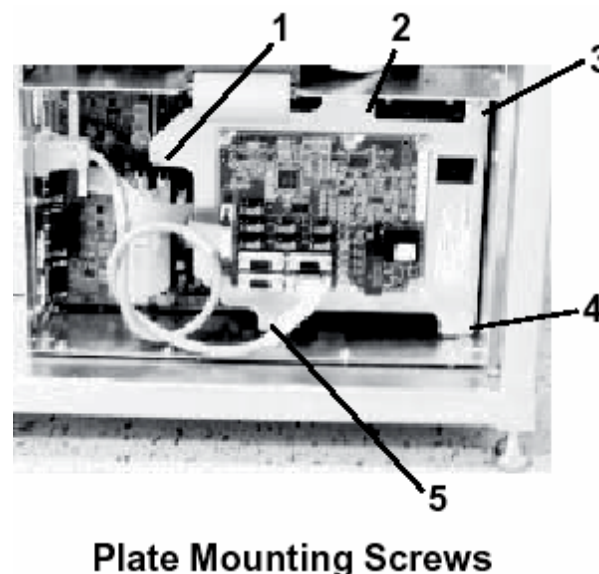
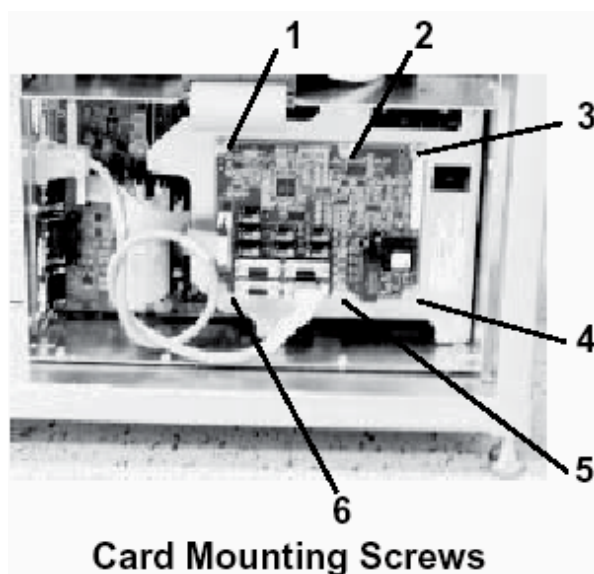
Unscrew twelve 5.5 mm screws that retain the cover panel and remove it. (1)



Power Unit Cover

AEC V2 PCB, its support, Generic I/F PCB, or kV Control PCB Removal

1. If you need to remove the AEC V2 PCB, remove any cables attached to the AEC V2 PCB. Remove the six 5.5 mm hex head screws (see arrows below) that secure the AEC V2 PCB; remove the PCB.



2. If you want to remove the Generic Interface PCB or the kV Control PCB, remove the cables. Remove the five 5.5 mm hex head screws (see arrows below) that secure the PCB mounting plate to the standoffs and remove the plate. After the AEC V2 PCB and plate are removed, remove the mounting 5.5 mm hex head mounting screws holding the desired PCB to the chassis and remove it. Reassemble the PCBs and mounting plate in the opposite order and re-plug in all cables.

Verify

1. Connect the Service Laptop.
2. Reapply power and verify that the eight LEDs on the kV Control PCB are scrolling.
3. Verify the software version.
4. If the software version corresponds to the version on the system delivered with the equipment (or upgraded), proceed to Database Restore. Refer to the RUS/RUT software Help file for instructions on how to accomplish the database download and restoration.
5. If not, download the software.
6. Restore the Database:
 - Up-to-date database, if available
 - Most recent or originally saved Data Base, if available
 - Default one from the floppy delivered with the equipment in the Service Tool set.

Alternately, you may try to swap the NVRAM chip (U59) from the former to the new kV Control PCB to preserve all of the parameters. If this chip is not involved in the failure or the cause for replacement, the swap will allow the up-to-date database to be kept and an AEC calibration will not be required.

Calibrate

1. Perform several exposures on both focus in several workstation, with exposure time longer than 12.5 ms.
2. If default database was restored, it is necessary to perform AEC calibration (if present) (refer to the *Automatic Exposure Control* in the *Calibration* section of this manual).
3. Save the Database on the service floppy disk delivered with the equipment.

AC/DC PCB (3-Phase AC Power)

DANGER: Before any manual intervention, ensure the main power is off. Apply lock out - tag out procedure for your own safety when working inside the equipment is required.

1. Insure that the neon (orange) indicator light on the PCB has gone out.
2. Be careful touching components on this PCB; some become very hot.
3. To protect the printed circuit boards, do not forget to wear the anti-static bracelet.

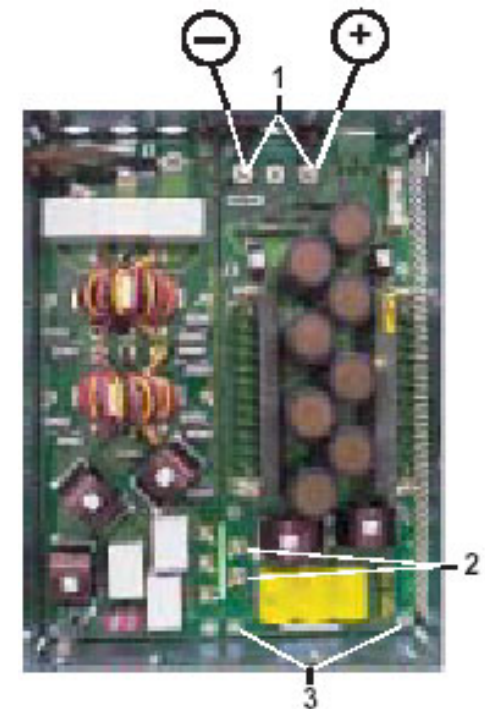
Disassembly

Note: The 3-Phase AC/DC PCB consists of two assemblies, the AC/DC PCB and the Rectifier Block.

AC/DC PCB Removal

Refer to the removal instructions for the EMC PCB prior to this section for removal of the AC/DC PCB.

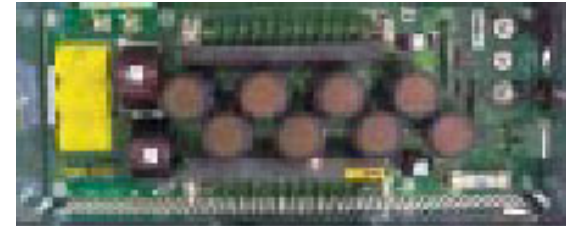
1. Remove the two DC cables fastened with 13 mm nuts on the PCB (1). If present, remove the cables of the discharging resistors circuit (installed in the heatsink of the rectifier bridge).



Replacement

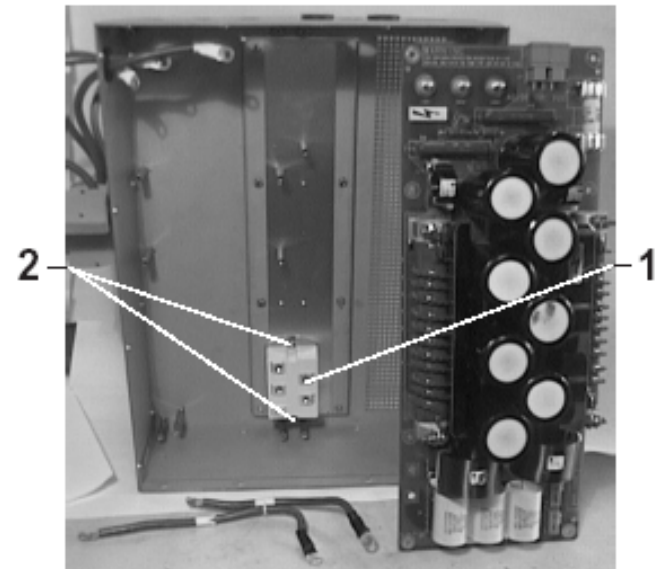
2. Remove two screws retaining the AC/DC PCB to the rectifier block (2).

Remove seven 5.5 mm hex head screws (3) and lift out the AC/DC PCB.



Rectifier Block Removal

1. The Rectifier Block (1) is visible after removing the EMC Board (refer to "EMC PCB 3-Phase AC Power" Disassembly/Reassembly).
2. With a 3 mm Allen wrench, unscrew the 2 screws (2) holding the rectifier to the chassis and remove the block.



Reassembly

1. Reverse the disassembly procedure to reinstall the AC/DC 3 PH Mid Power Assembly and the EMC Board.
2. Tighten the 10 mm cable retaining nuts to 3 N.m (30 kg.cm), and the 5.5 mm hex head screws to 1.5 to 2 N.m (15 to 20 kg.cm).

Caution: *Ensure cable terminals are repositioned as they were before disassembly.*

Verify that the + and - DC Bus cables are not reversed to prevent damage to the Inverter

The Rectifier Block has to be placed with the two poles in regard of the AC/DC PCB.

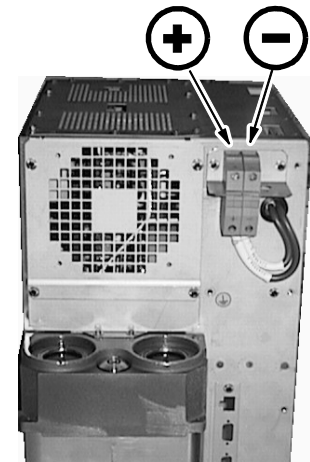
Be careful to preserve the special grease that is spread between the Rectifier Block and the chassis. This grease, called: "Conductive Surface Compound" provides both thermal and electrical conductivity that is important in reducing failure of the rectifier.

Be sure to place the "+" and "-" DC BUS in the right connectors as shown.

3. Remount the AC/DC Module inside the Cabinet.

Verify

Reapply power and verify that the system functions correctly.



EMC PCB (3-Phase AC Power)

DANGER: Before any manual intervention, ensure the main power is off. Apply lock out - tag out procedure for your own safety when working inside the equipment is required.

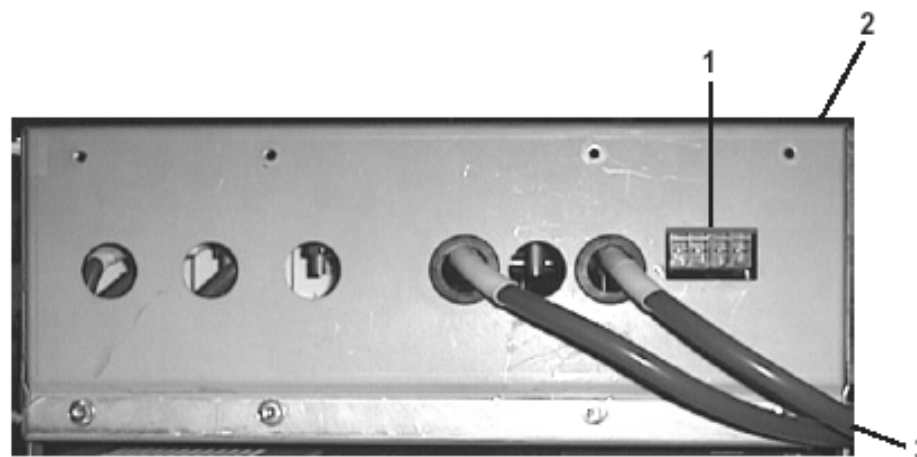
To protect the circuit boards, do not forget to wear the anti-static bracelet.

The EMC PCB is located within the AC/DC Module.

Disassembly

AC/DC Module Removal

1. Disconnect the cable (1) from J2 AC/DC.
2. Disconnect the large cables (3) from the Power Module (+) and (–) connector on the lower shelf of the generator chassis.
3. Unscrew the ground bolt (2) on the lower rear corner of the module box.
4. Move the AC/DC Module assembly on its hinges from the chassis cabinet.



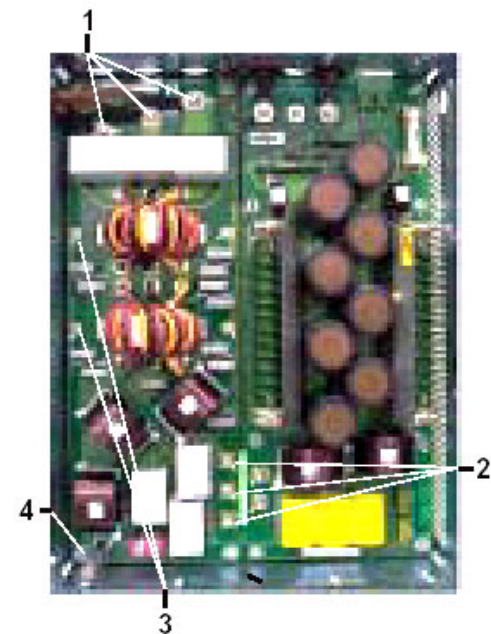
AC/DC Module
Top View

EMC PCB Removal from the AC/DC Module

1. Remove the twelve 5.5 mm hex head screws which secure the cover and remove it.
2. Remove the three nuts (1) securing the phase cables and three screws (2) retaining the EMC PCB to the rectifier block.
3. Unscrew nine 5.5 mm hex head screws (3).
4. Remove the Standoff and remove the **EMC PCB** (4).



EMC PCB



TOP VIEW

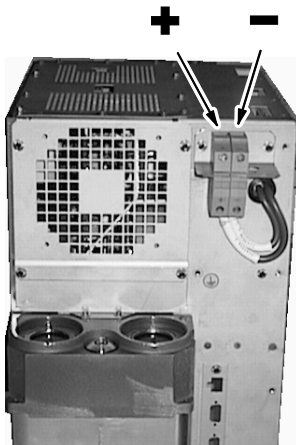
Reassembly

1. Reverse the disassembly procedure to reinstall the EMC PCB.
2. Tighten 5.5 mm screws to torque between 1.5 and 2 N.m (15 to 20 kg.cm).

Caution: *Ensure that U1 ground bolt is tightened to the torque of between 1.5 and 2 N.m (15 to 20 kg.cm).*

3. Remount the AC/DC and Auxiliary Units Assembly inside the Cabinet.

Caution: *Be sure to place the + and - DC BUS cables in the proper connector as shown below.*



Verify

1. Reapply power and verify the presence of 3-phase AC power.
2. Verify that the system functions correctly.

LVPS-400 Power Supply

DANGER: *Before any manual intervention, ensure the main power is off. Apply lock out - tag out procedure for your own safety when working inside the equipment is required.*

1. Insure that the Neon DS3 (green) indicator light on the Filament PCB and the Neon DS8 of LVPS-400 have gone out.
2. Be careful touching components on the Filament Board or LVPS-400. Some become very hot.
3. To protect the circuit boards, do not forget to wear the anti-static bracelet.



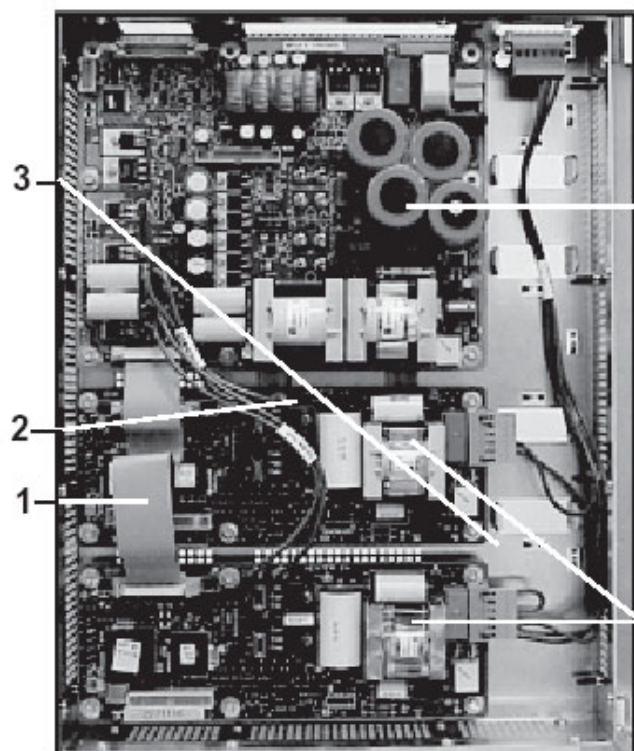
Disassembly

Filament PCB Cover Removal

Note: The removal of the LVPS-400 PCB can be done without removing the LVPS-400 Module from the generator cabinet.

Unscrew the twelve 5.5 mm hex head screws and remove the cover on the LVPS-400 Power Supply.

Filament PCB Removal



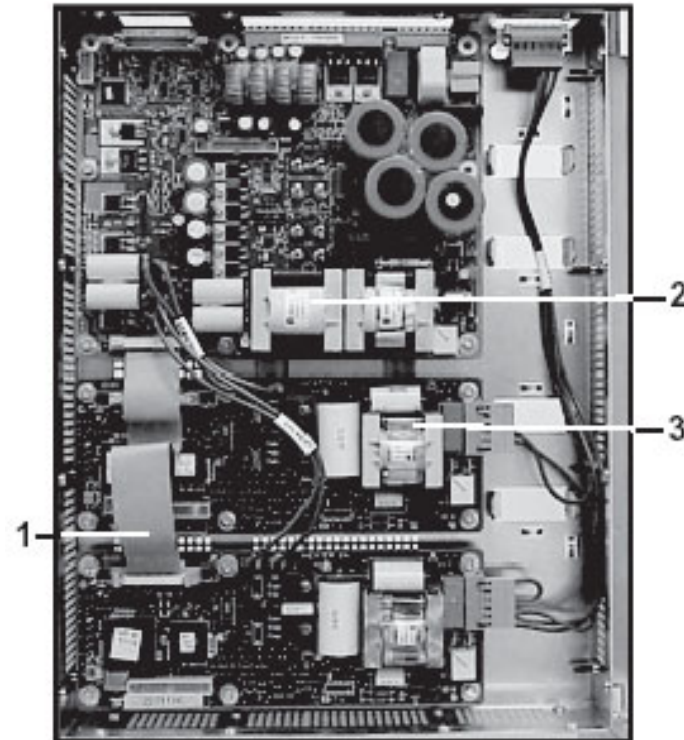
1. Disconnect the ribbon cable (1) between the Filament PCB (two boards present) (4) and the LVPS-400 PCB (5).
2. Disconnect (2) and the connector J2 (3).
3. Unscrew the six 5.5 mm hex head screws and remove the Filament Heater PCB (4).

LVPS-400 PCB Removal

1. Remove cables (1)
2. Remove four MOS transistor screws from heatsink (2).

Replacement

3. Remove the 5.5 hex screws.
4. Remove the LVPS-400 (3) PCB.



Reassembly

1. Reverse the disassembly procedures to reinstall the Filament PCB.

Caution: Verify that cables CF4 (160 V) and CF3 (0 V) (2) are not reversed before power ON.

2. Tighten the 5.5 mm hex head screws to 1.5 to 2 N.m (15 to 20 kg.cm).

Replacement

3. Remount the cover. Tighten the 5.5 mm hex head screws to 1.5 to 2 N.m (15 to 20 kg.cm).

Verify

Verify that the system functions correctly and run Heater Function Diagnostics.



Rotation PCB

DANGER: *Before any manual intervention, ensure the main power is off. Apply lock out - tag out procedure for your own safety when working inside the equipment is required.*

1. Insure that the Neon DS7 (orange) indicator light on the Rotation PCB has gone out.
2. Be careful touching components on the Rotation PCB. Some become very hot.
3. To protect the circuit boards, do not forget to wear the anti-static bracelet.

Disassembly

Rotation PCB Cover Removal

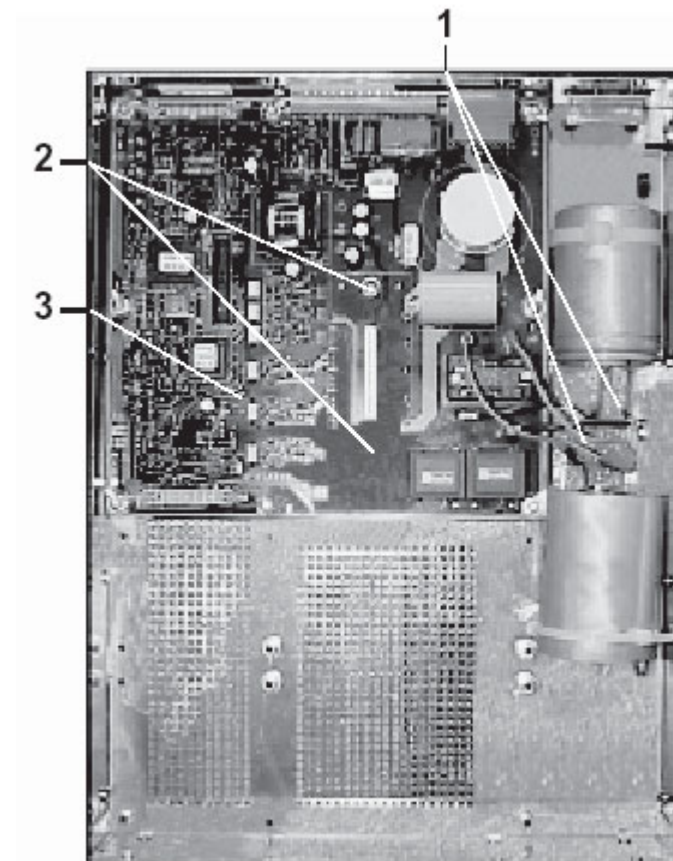
Note: Removal of the Rotation PCB can be done without removing the Rotation Module from the generator cabinet.

Unscrew the twelve 5.5 mm hex head screws and remove the cover from the Rotation Module.

Rotation PCB Removal

1. Disconnect Capacitor cables CF9, CF10, CF11, CF12 (1).
2. Unscrew two 5.5 mm hex head screws the board and that secure an IGBT in holes (2) below the surface of the PCB.
3. Unscrew the eight 5.5 mm hex head screw and remove the High Speed Rotation PCB (3).

Note: *Be careful to preserve the special grease that is spread between the IGBT and a heat sink under the Rotation PCB. grease, called "Conductive Surface Compound," provides both thermal and electrical conductivity important in reducing failure IGBT.*



*This
of the*

Reassembly

1. Reverse the disassembly procedure to reinstall the Rotor Board High Speed.
2. Tighten the 5.5 mm hex head screws to 1.5 to 2 N.m (15 to 20 kg. cm).

Caution: *Ensure that cables are correctly connected. Ensure that marks on the cables match the marks on the board.*

3. Remount the cover. Tighten the 5.5 mm hex head screws to 1.5 to 2 N.m (15 to 20 kg.cm).

Verify

Verify that the system functions correctly.

Run Rotation Function Diagnostics.

Rotation Module Capacitor Set Replacement

Danger: *Before any manual intervention, ensure the main power is off. Apply lock out - tag out procedure for your own safety when servicing of the equipment is required.*

To protect the circuit boards, do not forget to wear the anti-static bracelet.

The Rotation Capacitors are located in the Generator Rotation Module. Refer to the *Generator Module Locator Diagram* elsewhere in this section.

On the Rotation Module, disconnect internal CAN cable, DC BUS, heater cable, and Tube cable.

Move the hinged module out of the cabinet and remove the Rotation Module cover by removing the 12 screws from the three sides of the module enclosure.

Note: *Replacement of the Rotation capacitors can be done without removing the Rotation Module from the cabinet.*

Rotation Capacitor Removal

1. Cut the tie-wraps (1)
2. Disconnect and remove both capacitors (2)



Reassembly

Reverse the disassembly procedures to reinstall the Rotor Capacitors.

Use tie-wraps to reattach the capacitors.

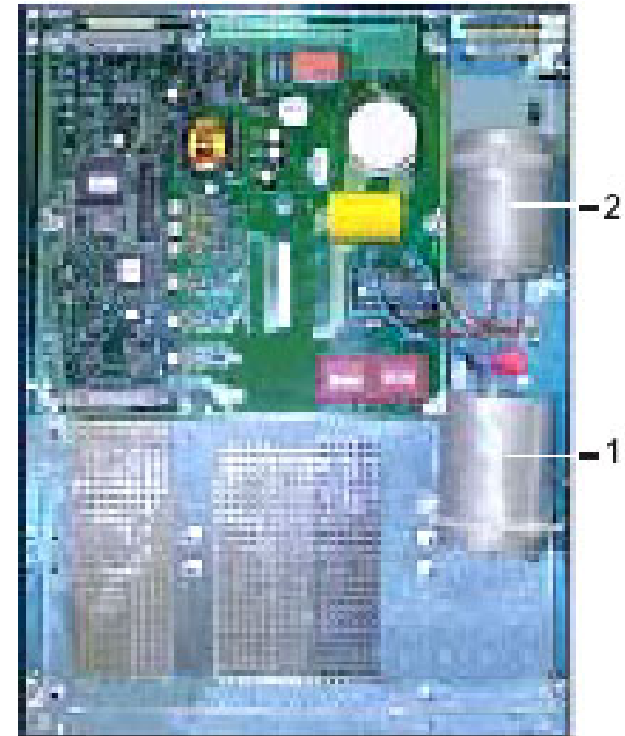
Be sure the capacitors are correctly connected:

- connect with cable 2298773 CF11 and CF12 to the below pins of the left capacitor **3.2 μF** (1).
- connect with cable 2298774 CF9 and CF10 to the upper pins of the right capacitor **10.4 μF** (2).

Verify

Verify that the system functions correctly.

Remount the cover and tighten the 12 hex head screws.



HV Tank Replacement

DANGER: Before any manual intervention, ensure that the main power is OFF. Apply Lock Out – Tag Out Procedure for your own safety when working inside the equipment is required.

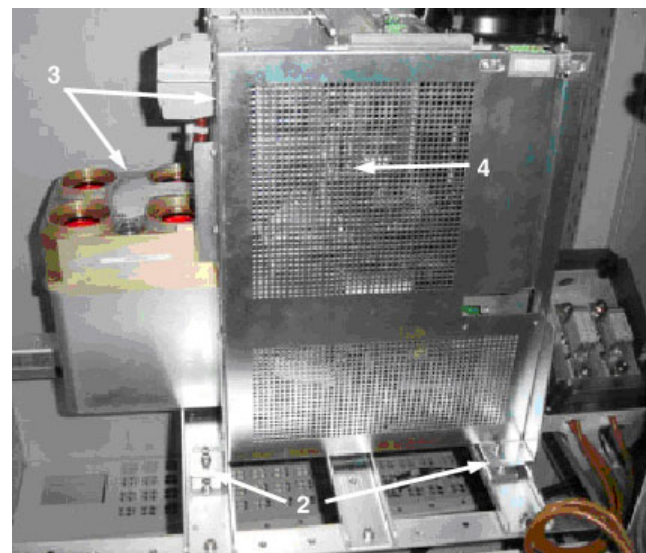
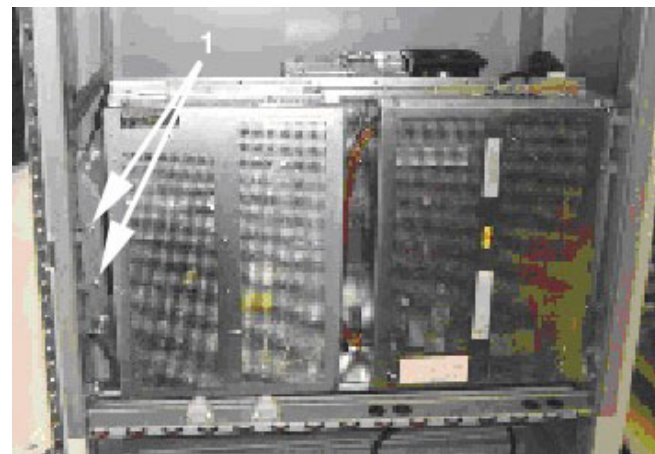
Tools Required

5.5mm and 13mm nut driver or socket wrench with ratchet.
Allen key 3mm, 5mm and 10mm
Screwdriver
Anti-Static bracelet

Disassembly

1. Open the Auxiliaries and ACDC Assembly by removing the two screws (1).
2. Remove all cables connected to the inverter.
3. Remove the two screws (2) securing the inverter.
4. Remove the inverter and tank assembly (3) from the generator chassis.
5. Remove the front cover (4) by removing the eight 5.5mm hex head screws.

WARNING: The inverter and tank assembly is heavy. **TWO PEOPLE ARE REQUIRED TO LIFT IT.**



Replacement

6. Remove the main heatsink (5) with the 10mm Allen key and the three long screws (6) and six short screws (7).
7. With the Allen 3mm key, remove eight screws (7) holding the front chassis (8) to the HV Tank.

